International Journal of Educology

A Journal of Research, Inquiry, and Development of: (1) the Educational Process from the Perspective of Educology, as Knowledge Claims about this Process, as integrated by educative experiences, and; (2) Educology as Knowledge Claims about the Educative Experience, as Integrated into the Educational Process, from the Perspective of Philosophy of Educology, as Knowledge Claims about this Experience

This issue of the

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will be referred to as

cd-IJE’s Perspectives on Education as Educology

to include the special issues of

Nos. 1 and 2, Volume 19, 2005

and

Nos. 1 and 2, Volume 20, 2006

of

IJE

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The 2005 and 2006 issues of cd-IJE will be published in e-IJE, as follows:

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April 1, 2006 to June 1, 2006 issue of e-IJE will contain the No. 2, Vol. 19, 2005 issue of cd-IJE

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Manuscripts

Manuscripts are reviewed anonymously, and those which are accepted are normally published in
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Manuscripts will be viewed with favor if they

(1) examine the educational process (or some aspect of the process) from an educological perspective and

(2) use appropriate rules of evidence to advance sound arguments in support of warranted conclusions.

Manuscripts, editorial correspondence and inquiries about submissions should be sent to:

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Recurring Editorial
Version 3.4

What follows is a recurring editorial in the form of a narrative outline as an introductory account of the format of the Compact Disk formatted International Journal of Educology (cd-IJE), as a journal published through the Institute of History and Philosophy of Educology for Developing Democracies in the World an initiative of Educology Research Associates/USA (ERA/USA).

The content of cd-IJE is formatted differently, since 2005. The new format recognizes the existence of the newly forming body of knowledge, i.e. philosophy of educology, as knowledge about educology, and the existence of a developed and developing body of knowledge, i.e. educology, as knowledge about educational processes in which organically inhere features of educative experiences.

The editorial has been put into narrative outline style, with the intent of providing, as well and short as possible, at this stage, a precise and concise account of these two developing bodies of knowledge in their interrelationship to each other and other developing bodies of knowledge. The editorial is planned for recurrence and revision in future issues of the Journal, from the 2005 issue on, with no terminal date set, at this time. Comments critiquing the Recurring Editorial are solicited by the operational and contributing editors. Such comments will be included in revisions of the editorial, in respect to its change for improvement.

Issues of cd-IJE, since 2005, then, have recognized the existence of philosophy of educology and published articles in it that have been written from various perspectives, including, but not limited to, the three perspectives (analytical, experiential, and phenomenological perspectives) accounted for in the outline, as the Journal has published articles in educology from various perspectives in the past.

A Recurring Narrative Outline as an Introduction to the Journal

The International Journal of Educology (the Journal) is a refereed journal (ISSN 0818-0563) that is published biannually (January and July) by Educology Research Associates/USA (ERA/USA), through its initiative of the Institute of History and Philosophy of Educology for Developing Democracies in the World (the Institute). Periodically, special issues of the Journal are published.

When distinguishing between a word, the meaning of a word, and the reference of the meaning of a word, the meaning of the word ‘educology’ refers to a fund of knowledge claims, i.e. the fund of knowledge claims about educational processes as processes in which organically inhere a logic, psychology, problematics, and methodology of educative experiences. The word ‘educology’ derives from the words ‘education’ and ‘logy’.

‘Educology’ has been in use, in the USA, since the seminal work by the late Professor Lowery W. Harding at Ohio State University in the 1950’s. Following this seminal work was that of Professors Emeritus Elizabeth Steiner (Maccia) and George Maccia at Indiana University in the 1960’s in the USA, and, James F. Christensen and James E. Fisher from the 1970’s to the present in Australia and the USA, mostly through Educology Research Associates in Australia and the USA.

In Europe, in 1978, Professor Wolfgang Brezinka at Konstanz University, Konstanz, Germany and, in 1978-79, Professor Anon Monshouwer at the Institute of Philosophy and History of Education, Nijmegen, The Netherlands, did pioneering work in philosophy of educology. Also, in Europe pioneering work in philosophy of educology has been done by Professor Leonas Javaisa, recently retired from Vilnius University, and is being done by Professor Kestutis Pukelis at Vytautas Magnus University, Kaunas, Lithuania and Professor Lilija Duobliene at Vilnius University, Vilnius, Lithuania, since 1991 in Lithuania, both of whom have published in cd-IJE.

In the fifty plus years since the seminal work of Professor Harding, with the meaning of the word
‘educology’ used to refer to a body of knowledge about educational processes, there has been, from the perspective of the Institute, a central challenge in philosophy of educology. It is:

The philosophical challenge of clarifying the nature of educological knowledge, i.e. clarifying the nature of educology, and its subject matter of educational processes, by critiquing experiences that are conducted in the areas of interest of logic, psychology, problematics, and methodology as disciplines that conditionally organize the features of reflective thinking experiences, whereby, these experiences: (1) organically inhere in knowing processes; (2) are engaged for the purpose of producing knowledge about education and a society of reflectively experienced educologists, and; (3) constitute a model for conditionally organizing the features of educative experiences; (i) that organically inhere in educational processes, and; (ii) that are engaged in developing democracies in the world for the purpose of producing a culture of educatively experienced citizens.

The account that follows and the Journal, itself, from the perspective of the Institute, are intended to be an introduction to work in philosophy of educology, hence, philosophy, aimed at meeting this challenge.

The Journal from the Perspective of the Institute

The content of the Journal is formatted from the point of view of an experientially oriented philosophy of educology, a kind of empirically oriented philosophy of educology, as grounded in the empirically oriented philosophy of American pragmatism, and, as being developed in the Institute. The Journal publishes works that:

1. examine, from the perspective of educology, the subject matter that accounts for educational processes in which organically inhere features of educative experiences that are modeled after reflective thinking experiences organically inhering in knowing processes, and;

2. examine, from the perspective of philosophy of educology, the subject matter that accounts for various areas of interest in knowing processes that conditionally organize, i.e. that discipline, features of reflective thinking experiences that: (i) organically inhere in knowing processes, and; (ii) constitute a model for educative experiences organically inhering in educational processes.

Subject Matter for Educology

Subject matter for educology, as the territory of educology, in general:

1. is subject matter that accounts for the various and complex aspects of educational processes, in which organically inhere features of educative experiences modeled after the features of reflective thinking experiences, and;

2. is subject matter that accounts for persons, including themselves;

2.1 in an organization of areas of interest that discipline features of educative experiences

2.2 of persons meeting, managing, and teaching themselves, and;

2.2.1. other persons who authentically (well) and in-authentically (ill) study,

2.2.2. for truly (well) and un-truly (ill) learning something,

2.3. in some situation.

The territory of educology, then, is that which is selectively emphasized and focused on, i.e. that is mapped, in and for educology:

1. featuring the aspects of educational processes in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2. featuring synergetic effects in and on, and that which cause synergetic effects in and on, the aspects of
educational processes, for example;

2.1. the governing factors, for example, of policy and curriculum development practices, and, supervisory and administrative practices as these factors have and do not have synergetic effects in and on educational processes in some situation, and;

2.2. the cultural factors, for example;

2.2.1. of forms of governments, economies, laws, habitus, and memes;
2.2.2. of forms of media and telecommunication networks;
2.2.3. of forms of sports and entertainment businesses;
2.2.4. of forms of industrialized science and technology business corporations, and;
2.2.5. of forms of information theory and knowledge societies;

as these factors have and do not have synergetic effects in and on educational processes in some situation and, by;

2.3. the ecosystem factors, for example;

2.3.1. of ecosystems, communities, and populations, and, of habitats and niches;
2.3.2. of bio-geo-chemical water, oxygen, and nitrogen eco-cycles, and;
2.3.3. of biotic and abiotic natural environments involving the trophic, i.e. nutritive, pyramids of feeding levels, food chains, and food webs;

as these factors have and do not have synergetic effects in and on educational processes in some situation.

Educology of this Subject Matter

As knowledge claims about the subject matter of the selectively emphasized and focused on complex of features, i.e. the mapped features, of situated educational processes, as features in which organically inhere educative experiences modeled after reflective thinking experiences organically inhering in knowing processes, educology is constituted by empirical knowledge claims, composed and asserted with warrant to meet:

1. the descriptive and predictive challenges established in producing, for example sociology, psychology, anthropology, and history as these funds of empirical knowledge claims are established in knowledge societies from the educological perspective:

1.1. not as the sociology of mapped features of educational processes, but as the educology of mapped features of social processes, producing sociologic educology;

1.2. not as psychology of mapped features of educational processes, but as educology of mapped features of psychical processes, producing psychologic educology;

1.3. not as anthropology of mapped features of educational processes, but as educology of mapped features of the cultural processes, producing anthropologic educology;

1.4. not as a history of mapped features of past educational processes, but as educology of mapped features of past processes, producing historic educology, and;

2. the predictive and prescriptive challenges established in producing economics, politicology, jurisprudence, praxiology as these funds of empirical knowledge claims are established in knowledge societies from the educological perspective:

2.1. not as economics of mapped features of educational processes, but as educology of mapped features of economic processes, producing economic educology;

2.2. not as politicology of mapped features of educational processes, but as educology of mapped features of political processes, producing politico educology;
2.3. not as jurisprudence of mapped features of educational processes, but as educology of mapped features of litigative and legislative processes, producing jurisprudential educology;

2.4. not as praxiology of mapped features of educational processes, but as educology of mapped features of the meeting, managing, teaching, studying, and learning processes, producing praxiologic educology.

Educology, then:

1. is a fund of empirical knowledge claims, that provide a perspective for producing warranted descriptive and predictive assertions about social, psychical, cultural, and historical processes, such that, then, educology divides into an:

1.1. educology of socially conducted human situated educational processes;

1.1.1. in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

1.1.2. about which is produced warranted assertions as to what is, and could be, the case in regard to these processes;

2.1. educology of psychically conducted human situated educational processes;

2.1.1. in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2.1.2. about which is produced warranted assertions as to what is, and could be, the case in regard to this process;

2.2. educology of culturally conducted human situated process;

2.2.1. in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2.2.2. about which is produced warranted assertions as to what is, and could be, the case in regard to this process;

2.3. educology of past humanly conducted situated process;

2.3.1. in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2.3.2. about which warranted assertions as to what was, and could be, the case in regard to this process, and;

2 is a fund of empirical knowledge claims that provide a perspective for producing warranted predictive and prescriptive assertions about economical, political, litigative and legislative, and meeting-managing-teaching-studying-learning regulated processes, such that, then, educology, further, divides into an:

2.1. educology of effective economically conducted human situated and regulated social processes;

2.1.1. in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2.1.2. about which is produced warranted assertions as to what could and ought to be the case in regard to these regulated social process;

2.2. educology of effective politically conducted human situated and regulated social process;

2.2.1 into in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;

2.2.2. about which is produced warranted assertions as to what could and ought to be the case in regard to these regulated social processes;

2.3. educology of effective litigatively and legislatively conducted human situated and regulated social processes;
2.3.1 into which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and
2.3.2. about which is produced warranted assertions as to what could and ought to be the case in regard to these regulated social processes, and;

2.4. educology of an effective meeting-managing-teaching-studying-learning conducted human situated and regulated process;
2.4.1. into which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and;
2.4.2. about which is produced warranted assertions as to what could and ought to be the case in regard to these regulated social processes;

**Educology as Subject Matter for Philosophy**

As a fund of a combination of various forms of descriptive, predictive, and prescriptive empirical knowledge claims:

1. educology has a subject matter selectively emphasized and focused on, i.e. mapped, that accounts for features of situated educational processes in which organically inhere educative experiences, conducted well and ill by persons, modeled after reflective thinking experiences organically inhering in knowing processes, conducted well and ill by persons, and;

2. educology is a subject matter selectively emphasized and focused on, i.e. mapped, that accounts for features of the situated knowing processes in which organically inhere reflective thinking experiences, conducted well and ill by persons that serves as a model for educative experiences organically inhering in educational processes, conducted well and ill by persons.

Whereas, then, as a fund of empirical knowledge claims, educology has a subject matter, and, it, itself, is subject matter, and, it is subject matter that compares and contrasts with that which is subject matter for it.

From the perspective of educology “having subject matter,” the subject matter:

1. is that of educational processes in which organically inhere educative experiences, modeled after reflective thinking experiences organically inhering in knowing processes, and

2. is the subject matter of empirical science.

From the perspective educology “being subject matter,” the subject matter:

1. is that of knowing processes in which organically inhere reflective thinking experiences, modeling educative experiences organically inhering in educational processes, and;

2. is the subject matter of empirical philosophy.

Each kind of subject matter, then, compares in that each kind selectively emphasizes and focuses on, i.e. in that each kind maps, conduct in situated processes, and, each kind of conduct, in these situated social processes, has a kind of experience organically inhering in it, whereby:

1. reflective thinking experiences organically inhere in the conduct of knowing processes and model educative experiences organically inhering in educational processes, and;

2. educative experiences organically inhere in the conduct of educational processes and model after reflective thinking experiences organically inhering in knowing processes.

Each kind of subject matter contrasts, however, in that:
1. educology has subject matter constituted by educational processes existing externally from itself, whereas;

2. educology, itself, is subject matter constituted by knowing processes existing internally to itself.

The subject matter of educology, as educology itself, then, is subject matter for empirically oriented philosophy, i.e. for empirical philosophy, but, not for empirically oriented science, i.e. not for empirical science. Educology, as subject matter selectively emphasized and focused upon, i.e. educology, as mapped subject matter, is that of a logically formed pattern of features of reflective thinking experiences organically inhering in the knowing process. It is the logically formed pattern of the conduct of reflective thinking experiences, incorporating the logically formed patterns of “discovery” and “verification” thinking experiences, conducted well and ill by persons obligated to conduct them as well as they can, for example, persons in knowing processes in a variety of “knowledge societies,” aka, information, information revolution, knowledge, third wave, informatization, and networks societies.

Such a variety ranges:

1. from persons obligated in scientific knowledge societies, for example:
   1.1. those persons obligated to meet the challenge of conditionally organizing their situated knowing processes in which reflective thinking experiences organically inhere, as practiced in sociology, psychology, anthropology, and history, to;
   1.2. those persons obligated to meet this challenge, as practiced in economics, politicology, jurisprudence, and praxiology;

2. from persons obligated in other scientific knowledge societies, for example:
   2.1. those persons obligated to meet the challenge of conditionally organizing their situated knowing processes in which reflective thinking experiences organically inhere, as practiced in physics, chemistry, and biology, to;
   2.2. those persons obligated to meet this challenge, as practiced in physical technology, chemical technology, and biological technology;

3. from persons obligated in “humanities” knowledge societies, for example:
   3.1. those persons obligated to meet the challenge of conditionally organizing their situated knowing processes in which reflective thinking experiences organically inhere as practiced in “literature;” art, and music, to;
   3.2. those persons obligated to meet this challenge, as practiced in theology;

4. from persons obligated in philosophical knowledge societies, for example:
   4.1. those persons obligated to meet the challenge of conditionally organizing their situated knowing processes in which reflective thinking experiences organically inhere, as practiced in rationalism, empiricism, logical positivism, and pragmatism, to;
   4.2. those persons obligated to meet this challenge, as practiced in existentialism.

Persons involved in knowledge societies, then, are persons obligated to meet the challenge of organizing knowing processes in which reflective thinking experiences organically inhere:

1. as practiced in the organization of conditions, i.e. in the conditional organization, of their knowledge society;

2. as determined by knowing processes in which organically inhere features of reflective thinking experiences, selected by their knowledge society for emphasis and being focused upon from the mapping of these features, and;
3. as subject matter inherent to educology as subject matter for philosophy in philosophy of educology.

Philosophy of Educology

Philosophy of educology, then, in general has educology:

1. as subject matter composed of knowing processes in which organically inhere features of reflective thinking experiences, hence;

2. as subject matter accounting for the process of regulating the meeting and managing of persons, including themselves;

   2.1. for the purpose of providing a conditional organization of knowing processes in which organically inhere features of reflective thinking experiences to be conducted by persons, well, i.e;

   2.2. for the purpose of providing conditions for organizing the social processes involving persons meeting and managing other persons, including themselves, in which the conduct of inquiry;

      2.2.1. obligates persons to authentically conduct, well, discovery thinking experiences, as involved in reflective thinking experiences in some situation, and;

      2.2.2. obligates persons to truly conduct, well, verification thinking experiences, as involved in reflective thinking experiences, in some situation.

Educology, itself, then, is subject matter that is the territory of empirical philosophy, in experiential philosophy of educology, wherein, in general, it, i.e. educology, is subject matter for philosophy, whereby, then, philosophy selectively emphasizes and focuses on:

1. the conduct of reflective thinking experiences organically inhering in knowing processes, and;

2. the synergetic effects in and on, and that which causes the synergetic effects in and on, the conduct of reflective thinking experiences organically inhering in knowing processes in some situation, for example;

   2.1. the governing factors of policy development practices, and, supervisory and administrative practices as these factors have and do not have synergetic effects in and on the conduct of reflective thinking experiences organically inhering in knowing processes, and;

   2.2. the cultural factors, for example;

      2.2.1. of forms of governments, economies, law, habitus, and memes;

      2.2.2. of forms of media and telecommunication networks;

      2.2.3. of form of sports and entertainment businesses;

      2.2.4. of forms of industrialized science and technology business corporations, and;

      2.2.5 of forms of information theory and knowledge societies;

as these factors have and do not have synergetic effects in and on the conduct of reflective thinking experiences organically inhering in knowing processes in some situation, and, by;

2.3. the ecosystem factors of, for example;

      2.3.1. of eco-systems, communities, and populations and of habitats and niches;

      2.3.2. of bio-geo-chemical water, oxygen, and nitrogen eco-cycles. and;

      2.3.3. of biotic and abiotic natural environments involving the trophic, i.e. nutritive, pyramids of feeding levels, food chains, and food webs;

as these factors have and do not have synergetic effects in and on the conduct of reflective thinking experiences organically inhering in knowing processes in some situation.

Philosophy of educology, then, has logically, epistemologically, and axiologically entailed orientations in
that:

1. it is axiologically oriented around the value of doing something as well as it can be done, wherein;

2. as oriented epistemologically, the doing something as well as it can be done is that of conducting knowing processes as well as they can be conducted, and;

3. as oriented logically in accord with the logic of reflective thinking experiences organically inhering in knowing processes.

Implied by these entailed orientations in philosophy of educology, as axiologically, epistemologically, and logically related issues in philosophy, is philosophical educology, also, as an axiologically related issue in philosophy.

**Philosophical Educology**

Philosophical educology, i.e. empirical philosophy of education as empirical philosophy of educational processes, is empirical axiological philosophy of educational processes as processes conditionally organized in home, school, and community educational institutions. From the axiological perspective of philosophical educology, as being developed in the Institute:

1. educative experiences organically inhering in educational processes ought to be valued by being organized to meet the conditions:

   1.1. entailed by an axiological orientation of philosophy of educology, i.e. the prescription to value doing something as well as it can be done in educational processes, as social processes conducted in home, school, and community educational institutions, and;

   1.2. entailed by an epistemological orientation of philosophy of educology, i.e. the prescription to value doing something as well as it can be done to be the prescription to value the conduct of educative experiences as they organically inhere in educational processes, i.e. social processes conducted in home, school, and community educational institutions, and;

   1.3. the prescription implied by the entailed obligation to conduct educative experiences organically inhering in educational processes, i.e;

      1.3.1. the prescription to organize the conditions in which educative experiences organically inhere in educational processes conducted in home, school, and community educational institutions, to be;

      1.3.2. modeled after the value of the organization of the conditions in which the reflective thinking experiences organically inhere in knowing processes conducted in knowledge societies, and ought to be obliged to be conducted by persons inside of educational institutions, and;

2. the educational process, organized to meet the conditions prescribed in philosophical educology, as stated above, ought to be valued and selectively emphasized and focused upon, i.e. ought to be valued and mapped, as subject matter for scientific educology.

**The Significance of Educology**

From the experientially oriented philosophy of educology perspective of the Institute, as a kind of empirically oriented philosophy of educology perspective, the account above was intended to be an introduction to work in philosophy of educology, hence, in philosophy, aimed at meeting:

Challenge 1: the philosophical challenge of clarifying the nature of educological knowledge, i.e. of educology and its subject matter of the educational process, and;

Challenge 2: the philosophical challenge of critiquing experiences in the areas of interest of logic, psychology, problematics, and methodology as disciplines that conditionally organize the features of
reflective thinking experiences, whereby, these experiences:

2.1. that when conducted well produces the body of educological knowledge, and, also that produces all other bodies of knowledge, and;

2.2. that functions as a model for educative experiences, that ought to be better integrated into the organization of conditions in which the educational process is conducted.

The account was also intended to be a sign to signify work done in the past, in and out of the Journal, and, work to be done in the future, in and out of the Journal, by scientific and philosophical educologists and philosophers of educology, in respect to these philosophical challenges in philosophy of educology.

The Significance of Work Done in the Past

In past issues of the Journal published from 1987 to 2003, Challenge 1, i.e. the philosophical challenge of clarifying the nature of educological knowledge and its subject matter of the educational process was attended to, however, Challenge 2, i.e. the philosophical challenge of critiquing the experience of areas of interest of logic, psychology, problematics, and methodology as disciplines that conditionally organize the features of reflective thinking experiences, was not attended to.

During this time, Challenge 1 was attended to primarily from an analytically oriented philosophy of educology perspective, rather than from an experientially oriented philosophy of educology perspective, both as kinds of an empirically oriented philosophy of educology perspective.

Analytical Philosophy of Educology

From within an analytic, rather than an experiential, philosophy of educology perspective, then, the content of the Journal was formatted with the interpretation of Kant’s first philosophy epistemologically oriented discernment between two forms of sentential meaning in language, two forms of experiences in life, two forms of non-innate knowledge in the conduct of the knowing process, and; one form of innate knowledge in the conduct of the knowing process:

1. from an early and later Wittgensteinian post modern functionally oriented epistemological perspective, in the philosophy of logical positivism, rather than;
2. from a Piercian post modern functionally oriented epistemological perspective, in the philosophy of pragmatism;

wherefore, then, Kant’s first philosophy discernment of these forms, as epistemologically oriented discernments, are:

1. between;
   1.1. analytic forms of sentential meaning, as meaning stated and formed in statements in language;
   1.2. synthetic forms of sentential meaning, as meaning stated and formed in statements in language;

2. between;
   2.1. a-priori forms of experience as forms outside of experiences in life;
   2.2. a-posteriori forms of experience as forms inside of experiences in life, and;

3. between;
   3.1. analytic a-priori forms of knowledge, as;
      3.1.1. non-innate outside of experience;
3.1.2. truly formed analytic meanings as tautological relationships of meanings in statements in language;

3.2. synthetic a-posteriori forms of knowledge, as;

3.2.1. non-innate inside of experience;
3.2.2. truly formed synthetic meanings as non-tautological relationships of meanings in statements in language and;

3.3. synthetic a-priori form of knowledge, as;

3.3.1. innate outside of experience;
3.3.2. truly formed pre-dispositions to conduct the knowing process in life experiences, using language, well, and;

were interpreted as discernments;

1. of functions of meaning states in the conduct of experience in the areas of interest of logic, psychology, problematics, and methodology as disciplines that conditionally organize the features of reflective thinking experiences of ordinary, scientific, and philosophic languages, in accord;

1.1. to how the non-innately;

1.1.1. true and false analytically formed sentential meaning states, and;
1.1.2. true and false synthetically formed sentential meaning states;

1.2. in these ordinary, scientific, and philosophic languages;

1.2.1. are comported well;
1.2.2. into the conduct of the conjunction of the disciplines of the logic, psychology, problematics, and methodology of verification thinking experiences;
1.2.3. as an aspect of the conjunction of these disciplines as conducted in reflective thinking experiences, and;

1.3. integrated and conducted well;

1.4. in the knowing process, rather than;

2. of functions of meaning states in the conduct of experience in the areas of interest of logic, psychology, problematics, and methodology as disciplines that conditionally organize the features of reflective thinking experiences of ordinary, scientific, and philosophic languages, in accord;

2.1. to how the non-innately;

2.1.1. true and false analytically formed sentential meaning states;
2.1.2. true and false synthetically formed sentential meaning states, and;

2.2. to how the innately;

2.2.1. and truly formed pre-disposition;
2.2.2. to conduct the knowing process;

2.3. are comported well;

2.4. into the conduct of reflective thinking experiences;

2.5. as conduct of;

2.5.1. the aspect of discovery thinking experiences, and;
2.5.2. the aspect of verification thinking experiences;
2.5.3. as two necessary and sufficient aspects of the;
2.6. conduct of reflective thinking experiences;
2.7. integrated and conducted well;
2.8 in the knowing process.

Also, from within an analytic, rather than an experiential, philosophy of educology perspective, the content of the Journal was formatted with the interpretation of:

1. Descartes’ epistemologically oriented discernment of doubt existing as a systematic rule integrated well into the knowing process conducted well, rather than of;
2. Pierce’s epistemologically oriented discernment of doubt existing as an irritable feeling, accompanying realistic imagination, interrupting urges to act, i.e. interrupting conations, as feelings of unsettlement integrated well into the knowing process conducted well, and, of;
3. Descartes’ ontologically oriented discernment of physical and mental substances.

From within an analytic, rather than an experiential, philosophy of educology perspective, the content of the Journal, then, was formatted with the interpretation of these discernments in philosophy:

1. from only the verification thinking experiences, as conducted in reflective thinking experiences, accounted for in the post modern era philosophy of logical positivism;
2. rather than from the conduct of both:
   2.1. the aspect of discovery thinking experiences, and;
   2.2. the aspect of verification thinking experiences;

as two necessary and sufficient aspects of the conduct of reflective thinking experiences, accounted for in the post modern era philosophy of pragmatism, and, adopted in experiential philosophy of educology as being developed in the Institute.

Analytical philosophy of educology, in the past, besides providing perspective for formatting the content and publication of the Journal, it, also provided perspective for work by its co-editors, Christensen and Fisher, out of the Journal from 1987 to 2003, in that it:

1. was grounded in the work of the co-editors of the Journal, from 1987 to 2003, i.e. James E. Christensen and James E. Fisher, specifically the work that they did, out of the Journal, as co-authors of the book Analytic Philosophy of Education as a Sub-Discipline of Educology: An Introduction to its Techniques and Application, University Press of America, Washington DC, 1979, and;
2. was used in their co-editorship of Organization and Colleges of Education: An Educological Perspective, Educology Research Associates, Sydney, Australia, 1983, wherein, an introduction is made of the account in the book of how courses and academic staff, in units in universities, the names of which contain the word ‘education’ e.g. colleges, divisions, and departments of, and, courses in education, but, better named by a name containing the word ‘educology’ e.g. colleges, divisions, and departments of, and, courses in educology, as they are in universities in Lithuania, Europe, can and ought to be organized so that conditions in knowledge society units in university educational situations include features constituting a structure that achieves logical consistency; retains flexibility; dispels ambiguity; overcomes undue pressure from traditional prejudices and interest groups; permits professional individuality and development, but excludes exploitation of the institution by the individual staff members, and; assures the integrity of the institution without stifling the creativity and responsible freedom of the professional staff members.

Analytical philosophy of educology, also, provided perspective for:

1. the below listed two important pieces of work in and out of the Journal, by Christensen:

   1.1. Perspectives on Education as Educology (edited by J.E. Christensen, Washington, D.C. University Press of America,1981);
1.2. Education and Human Development: A Study in Educology (J.E. Christensen, Educology Research Associates, Sydney, 1981);


1.4. “Education for Freedom: A Philosophical Educology” (J.E. Christensen, International Journal of Educology, 6:2, 1992, 97-131);

2. the below listed two important pieces of work, in and out of the Journal, by Fisher


3. the below listed five important pieces of work in and out of the Journal, by Maccia, Brezinka, and Monshouwer:


3.3. “Meta-Theory of Education: European Contributions from an Empirical-Analytical Point of View” (Wolfgang Brezinka, Perspective on Education as Educology, Edited by James E. Christensen, 1981, 7-26)


Critique of Analytical Philosophy of Educology


This work is clearly in the phenomenological philosophy of educology perspective, in which Steiner:

1. critiques, favorably, the conduct of a systematic phenomenology as the conduct of a phenomenological method, i.e. a method constituted by:

   “formal patterns of intuition, rules for intuitive thinking, in order to present the essence of phenomena. It is the doing of descriptive metaphysics.” (pg. 226);

whereby, then, essences exist in;

   “the ideational realm” of consciousness. (pg. 226)
2. interprets the educational process as phenomena:

"that involves subjects; subjects who are guiding the formation of consciousness of other subjects (learners) and so are teachers, and subjects (learners) who are actively participating in the formation of their consciousness and so are students. To study education, therefore, is also to study consciousness, namely the conscious formation of consciousness." (pg. 222) And, in conclusion;

3. states:

“If one follows the rules of the phenomenological method, then one can grasp essences. These essences are not relative, i.e., arbitrarily introduced by human beings through their conventions insofar as they assign meanings. Meanings are not arbitrarily assigned; there are essences to be grasped. The world which is experienced after the reduction to the pure life of consciousness is an intersubjective world, it is accessible to anyone. So the essence of education can be grasped. The metaphysics of education can be done. The essential properties of teacher, student, content, and context—the elements of the teaching-studenting process—can be set forth. A meaning basis for empirical studies of regularities can be provided. The crisis in educology can be resolved. Phenomenology is a genuine rationalism.” (pg. 227)

It is to be noted that Steiner, uses the meaning of the word ‘essence’ to refer to that which exists as ideations and that which “assigns meaning,” to be the basis of something, whereby, though, essences or ideations as forms, structures, or states are not identical to the existence of meaning, itself, whereby, then;

1. that which exists;

1.1. as a special, essential, or ideational property as a state of status that specially, essentially, or ideationally forms a state of status of something to be what it is and not to be some other special, essential, or ideational form of thing, therefore;

1.1.1. that which exists that specially, i.e., essentially forms or states of the “pure life of consciousness;” i.e;
1.1.2. a life that, after conducting reductive thinking by following a set of “rules of intuitive thinking;”
1.1.3. is a life of being conscious of pure essences or ideations as forms that state the status of things, i.e;
1.1.4. a life of consciousness that can be “grasped,” or directly and immediately known;

1.1.4.1. by intellectual observation, but;
1.1.4.2. not by sensory observation, hence;

2. that which exists;

2.1. that determines;

2.1.1. a life of pure forms as a life purely known by persons referred to by the meaning of the word ‘subjects’ following the conduct of a set of rules for thinking in which to make intellectual observations of essences or ideations that form things,” and;

2.1.2. a life of impure forms as a life impurely known by persons referred to by the meaning of the word ‘subjects’ following the conduct of a set of rules for thinking in which to make sensory observation of the things, but not the essences or ideations that form things, hence;

2.1.3. a life in an interactive and “intersubjective world,” that:

2.1.4. “is accessible to anyone,” and;

2.2. that provides:
2.2.1. “a meaning basis, state, or status for empirical studies of regularities,” in and for the educational process, i.e. of the regulations in and for the educational process, therefore;

2.2.2. a foundation for empirical scientific and empirical philosophic educology of this process.

In this work, Steiner critiques, unfavorably, the analytical philosophy of educology perspective, as being:

1. a limited perspective in that it is grounded in a philosophy of logic from the perspective of the philosophy of logical positivism, or as she would characterize it, from the perspective of a naturalistically oriented philosophy of science, wherein;

2. this logic, as a methodology of science, i.e. as knowledge about a method for conducting science, when integrated and conducted well in the knowing process, for producing scientific and philosophic educology, i.e. for producing scientific and philosophic knowledge about the educational process;

3. does not adequately account for the significance of the educational process, as this process; from the perspective of phenomenological philosophy of educology;

4. involves persons, as subjects, conducting the conduct of the conscious formation of consciousness, as integrated well into educational phenomena, modeled after the well conduct of systematic phenomenology, integrated well into the knowing process, in that, as Steiner says:

   “... consciousness is not simply a cognitive state. A cognitive state cannot occur without volition and feeling. Conation is involved, because signs are always standing for somebody. An ‘I’ gives meaning; there is intentionality. Moreover, since there is self-awareness, there is feeling; there is a state of affect. Within experiencing or consciousness, we can logically sort out cognition, conation, and affect, but in any experiencing all three are together.” (pg. 224)

Steiner is making a very similar, if not identical, point that was made earlier, from the experiential philosophy of educology perspective, i.e. the point that the analytical philosophy of educology perspective is limited in that:

1. its logic is that of the conduct of only verification thinking experiences, as conducted in reflective thinking experiences;

2. rather than the conduct of both:

   2.1. discovery thinking experiences, and;
   
   2.2. verification thinking experiences;

3. as two necessary aspects of the conduct of the conduct of reflective thinking experiences;

4. accounted for in the post modern era philosophy of pragmatism, and;

5. adopted in experiential philosophy of educology;

6. as being developed in the Institute.

The point in common between phenomenological philosophy of educology and experiential philosophy of educology is that both logics incorporate “cognition, conation, and affect,” as well as volition and eidetic imagery, i.e. imagination, into the breadth of aspects of consciousness, whereas, however, analytical philosophy of educology incorporates only cognition into the breadth of consciousness, whereby:

1. the cognitive aspect as a logical state of consciousness;

   1.1. in the phenomenological philosophy of educology perspective;

   1.1.1. is that aspect which constitutes the essences or ideational, i.e. the formal aspect of phenomena, that is consciously intellected, and;
1.1.2. is the logical state of status of consciousness;

1.2. in the experiential philosophy of educology perspective;

1.2.1. is that aspect which constitutes the meanings, i.e. the formal aspect of possible forms or states of conduct that is consciously intellected, and;
1.2.2. is the logical state of consciousness, and;

1.3. in the analytical philosophy of educology perspective;

1.3.1. is that aspect which constitutes the analytic a-priori knowledge, i.e. the formal aspect of tautological relationships of meanings that is consciously intellected, and;
1.3.2. is the logical state of consciousness;

1.4. all of which are integrated and conducted well in the knowing process, and;

2. the conative, affective, volitional, and imaginative aspects as psychical events in consciousness;

2.1. in the phenomenological philosophy of educology perspective;

2.1.1. are the aspects that constitute the psychical events;
2.1.2. in consciousness that are sensed;
2.1.3. by internal sensory observation, and, are;
2.1.4. events in consciousness;
2.1.5. to be selectively emphasized and focused on, i.e. mapped, as;

2.1.5.1. the subject matter for psychology, as knowledge about the psyche, and
2.1.5.2. the subject matter to be;

2.1.6. dissociated from;
2.1.7. the cognitive aspect, as the logical state of consciousness by;
2.1.8. following the conduct of systematic phenomenology, as
2.1.9. well integrated and conducted;
2.1.10. in the pure knowing of essences as forms or states of phenomena feature of
2.1.11. the knowing process;

2.2. in the experiential philosophy of educology perspective;

2.2.1. are the aspects that constitute the psychical events;
2.2.2. in consciousness that are sensed;
2.2.3. by internal sensory observation, and, are;
2.2.4. events in consciousness
2.2.5. to be selectively emphasized and focused on, i.e. mapped, as

2.2.5.1. the subject matter for psychology, as knowledge about the psyche, and
2.2.5.2. the subject matter to be;

2.2.6. associated with;
2.2.7. the cognitive aspect, as the logical state of consciousness by
2.2.8. following the conduct of reflective thinking experiences, as constituted by;

2.2.8.1. the conduct of discovery thinking experiences, and;
2.2.8.2. the conduct of verification thinking experiences, as;

2.2.9. well integrated and conducted in
2.2.10. the understanding of meanings as possible forms of states of conduct feature of
2.2.11. the knowing process, and;
2.3. in the analytical philosophy of educology perspective;

2.3.1. are the aspects that constitute the psychical events:
2.3.2. in consciousness that are sensed;
2.3.3. by internal sensory observation, and, are;
2.3.4. events in consciousness;
2.3.5. to be selectively emphasized and focused on, i.e. mapped, as;

2.3.5.1. the subject matter for psychology, as knowledge about the psyche, and
2.3.5.2. the subject matter to be;

2.3.6. dissociated from;
2.3.7. the cognitive aspect, as the logical state, of consciousness;
2.3.8. by following only the conduct of verification thinking experiences, as
2.3.9. well integrated and conducted in
2.3.10. the analytic knowing of tautological relationships of meanings as states feature of:
2.3.11. the knowing process

This critique of the breadth of psychical aspects, as psychical events, in consciousness in analytical philosophy of educology, as a limitation from the perspective of phenomenological philosophy of educology, correlates with a critical difference between phenomenological and experiential philosophies of educology, and, between them and analytical philosophy of educology, as that of how the meaning of the word ‘cognition’ is used when referencing an aspect of, i.e. a state of, not events in, consciousness involved in logic as conducted and integrated well in the knowing process. Whereas:

1. as constituted in phenomenological philosophy of educology, the meaning of the word ‘cognition’ is used:

   1.1. to refer to the direct and immediate intellectual observation, intuition, grasping, or direct and immediate pure knowing;
   1.2. of the existence of “essences or ideations as actual forms of phenomena;”
   1.3. as kinds of metaphysical existents, and;
   1.4. as the “given” in the logical state of, not psychical events in, consciousness, that;
   1.5. “assigns” meaning states, that;
   1.6. “comports” significant conduct in;
   1.7. the conduct of the conscious formation of consciousness;
   1.8. constituted in the conduct of systematic phenomenology;
   1.9. as integrated and conducted well;
   1.10. in the knowing process;

2. as constituted in experiential philosophy of educology, the meaning of the word ‘cognition’ is used:

   2.1. to refer to the direct and immediate intellectual observation, intuition, grasping, or direct and immediate understanding;
   2.2. of the existence of “meaning states as possible forms of conduct;”
   2.3. as kinds of special conduct, and;
   2.4. as the “given” in the logical state of, not psychical events in, consciousness,
that;

2.5. “comports” significant conduct in;

2.6. the conduct of reflective thinking experiences;

2.7. constituted by the conjugation of;
   2.7.1. the conduct of discovery thinking experiences, and;
   2.7.2. the conduct of verification thinking experiences;

2.8. as integrated and conducted well;

2.9. in the knowing process, and;

3. as constituted in analytical philosophy of educology, the meaning of the word ‘cognition’ is used:
   3.1. to refer to the direct and immediate intellectual observation, intuition, grasping, or direct and immediate analytic knowing;
   3.2. of the existence of “tautological relationships of meanings as states of actual physical forms of referents;”
   3.3. as the only kinds of referents that can be verified;
   3.4. as the “given” in the logical state of, not psychical events in the consciousness of verification thinking experiences, that;
   3.5. “comports” significant conduct in;
   3.6. the conduct of sensory experience;
   3.7. the conduct of symbolic logic;
   3.8. as integrated and conducted well;
   3.9. in the knowing process.

The fundamental difference, then, between phenomenological, experiential, and analytical philosophies of educology is that of the difference in the use of the meaning of the word ‘cognition’ to refer to cognition:

1. as a logical state of, not as a psychical event in, pure knowing of essences as forms of phenomena;

2. as a logical state of, not as a psychical event in, understanding of meanings as possible forms of conduct, and;

3. as a logical state of, not as a psychical event in, analytic knowing of tautological relationships of meanings as actual forms of physical referents, as these relationships between meanings are integrated into the conduct of the conjunction of the logic and psychology of the knowing process.

With this discernment between the logical state of consciousness, intellectually observed, and psychical events in consciousness, internally sensorily observed:

1. in phenomenological philosophy of educology’s logic, the meaning of the word ‘cognitive’ implies the direct and immediate “pure knowing” of essences as actual forms or states of things being well integrated and conducted in the knowing process;

2. in experiential philosophy of educology’s logic, the meaning of the word ‘cognitive’ implies the direct and immediate “understanding” of meanings as possible forms or states of conduct being well integrated and conducted in the knowing process, and;
3. in analytical philosophy of educology’s logic, the meaning of the word ‘cognitive’ implies the direct and immediate “analytic knowing” of tautological relationships of meanings as actual forms or states of physical referents being well integrated and conducted in the knowing process.

Using the meaning of the word ‘cognition’, in the perspective of phenomenological philosophy of educology, the knowing process, as the well conduct of the conscious formation of consciousness is well integrated into it, is such that, if followed well, then;

1. pure states, i.e. essences or ideations as actual forms or states of things can be grasp, intuited, intellectually observed, i.e. directly and immediately known, as they exist as cognitive states, i.e. logical states of pure consciousness of subjects, in so far as, however;

2. impure events, i.e. imagination of psychic images, emotion of psychic feelings, volition of psychic determination to move, and, conation of psychic urges to move, that exist as psychical events in the consciousness of subjects are:
   2.1. selectively emphasized and focused on so as;
   2.2. to disassociate them, by excluding them, from being focused on;
      2.2.1. so that the pure states of, i.e. the essences as forms of, things;
      2.2.2. in the consciousness of subjects;
   2.3. can be selectively emphasized and focused on;
      2.3.1. to be grasp, intuited, intellectually observed, i.e. directly, immediately, and purely known;
      2.3.2. so as to assign states of meaning, not events of imagery and/or feelings;
      2.3.3. to be well integrated;
   2.4. into the knowing process conducted well, therefore;
      2.4.1. providing a logical state for;
      2.4.2. internally and externally oriented sensory observations;
      2.4.3. in verification thinking experiences.

Using the meaning of the word ‘cognition’ from the perspective of experiential philosophy of educology, the knowing process, as the well conduct of discovery and verification thinking experiences, in the reflective thinking experience, is well integrated into it, is such that, if followed well, then;

1. as possible forms of conduct, states of meanings can be grasp, intuited, intellectually observed, i.e. directly and immediately understood, as they exist in the cognitive, i.e. logical, state of consciousness of subjects, in so far as;

2. imagination, emotion, volition, and conation as psychical events in the consciousness of subjects exist in association with possible forms of conduct as meaning states existing as the cognitive, i.e. logical, state or status of consciousness of subjects, whereby, the psychical events are:
   2.1. selectively emphasized and focused on so as;
      2.1.1. to associate them, by including them, with;
      2.1.2. possible forms of conduct, as states of meanings;
      2.1.3. in the logical state of consciousness of subjects;
      2.1.4. so that states of meanings as plausible forms of conduct:
   2.2. can be selectively emphasized and focused on;
      2.2.1. to be grasp, intuited, intellectually observed, i.e. directly and immediately understood;
      2.2.2. so that meaningful conduct becomes integrated well;
   2.3. into the knowing process conducted well, therefore;
Using the meaning of the word ‘cognition’ from the perspective of analytical philosophy of educology, the knowing process, as the conduct of only verification thinking experiences, is such that, if followed well, then:

1. meanings as actual forms or logical states for referencing only physical referents can be grasp, intuited, intellectually observed, i.e. directly and immediately analytically known, as they condition the consciousness of subjects, in so far as;

2. imagination, emotion, conation, and volition as psychical events in consciousness exist in disassociation with meanings as possible forms or states of conduct in verification thinking experiences of subjects, whereby, the psychical events in consciousness are:

   2.1. selectively emphasized and focused on so as;

      2.1.1. to disassociate, by excluding them, from;
      2.1.2. meanings as actual forms or states for only referencing;
      2.1.3. physical events and objects;
      2.1.4. in verification thinking experiences;

   2.2. so that meanings, also, as plausible forms or states of conduct:

      2.2.1. can be selectively emphasized and focused on;
      2.2.2. to be grasped, intuited, intellectually observed, i.e. directly and immediately analytically known as tautological relationships of meanings;
      2.2.3. for meaningful conduct becoming integrated well;

   2.3. into the knowing process conducted well, therefore;

   2.4. providing a logical state for;

   2.5. sensory observations, in;

   2.6. the conduct of verification thinking experiences.

Critique of Analytical and Phenomenological Philosophies of Educology

From the perspective of experiential philosophy of educology, then, both analytical and phenomenological philosophies of educology are critiqued, unfavorably, hence, are limited in that they both disassociate, by excluding, psychical events in consciousness from the logical state of consciousness, in the knowing process, though in different ways, whereas, however, experiential philosophy of educology, associates, by including, them in consciousness in the knowing process, in that:

1. Phenomenological philosophy of educology does the dissociation:

   1.1. directly through its rules of reduction, constituting;

   1.2. the conduct of systematic phenomenology;

   1.3. involving eidetic reduction, i.e.

   1.4. dissociating, by excluding;

      1.4.1. imagery in imagination, feelings in emotion, urges to move in conation, and
determination to move in volition;
1.4.2. as psychical events in consciousness, and;
1.4.3. sensorily observed;
1.4.4. by internally oriented sensory observation, and;

1.4. dissociating, by excluding:
   1.4.1. physical events external to consciousness;
   1.4.2. as sensorily observed;
   1.4.3. by internally oriented sensory observation, and;

1.5. associating, by including;

1.6. intellectual observations of essences, i.e. of ideations,

1.7. as purely knowing, i.e. purely cognizing;

1.8. the logical states of consciousness;

1.9. as actual forms of phenomenon;

1.10. as integrated and conducted well;

1.11. in the knowing process, and;

2. Analytical philosophy of educology does the dissociation:
   
2.1. indirectly through its rules of reduction, constituting;

2.2. the conduct of symbolic logic;

2.3. involving declaratively formed sentences functioning as statements, i.e;

2.4. involving sententially formed meanings, as logically formed cognitive states, in;

2.5. ordinary, scientific, and philosophical languages;
   
   2.5.1. being reduced to atomic, or, protocol sententially formed meaning states;
   2.5.2. referring to, and only to;
   2.5.3. physical event and objects
   2.5.4. external to consciousness;
   2.5.5. sensorily observed;
   2.5.6. by externally oriented sensory observation;

2.6. dissociating, by excluding, psychical events;
   
   2.6.1. in consciousness;
   2.6.2. sensorily observed;
   2.6.3. by internally oriented sensory observation, but;

2.7. associating, by including, the logical state;
   
   2.7.1. of analytic knowing, i.e. analytic cognizing;
   2.7.2. tautological relationships of meanings;
   2.7.3. intellectually observed;
   2.7.4. as actual forms of physical events and objects, and;

2.8. associating, by including, physical events and objects;
   
   2.8.1. sensorily observed;
   2.8.2. by externally oriented sensory observation;
2.9. as integrated and conducted well;

2.10. in the knowing process, and;

3. Experiential philosophy of educology does the association:

3.1. directly through its principle of eduction, involved in;

3.2. the conduct of reflective thinking experiences, constituted by;
   3.2.1. the conduct of discovery thinking experiences, and;
   3.2.2. the conduct of verification thinking experiences;

3.3. involving declaratively formed sentences functioning as statements, i.e;

3.4. involving sententially formed meanings states in;

3.5. ordinary, scientific, and philosophical languages;
   3.5.1. being educted for;
   3.5.2. referring to, but, not only to;
   3.5.3. physical events and objects, hence;

3.6. associating, by including, psychical events;
   3.6.1. internal to consciousness;
   3.6.2. sensorily observed;
   3.6.3. by internally oriented sensory observation, and;

3.7. associating, by including, physical aspects;
   3.7.1. external to consciousness;
   3.7.2. sensorily observed;
   3.7.3. by externally oriented sensory observation, and;

3.8. associating, by including, logical states;
   3.8.1. of understanding meanings;
   3.8.2. as forms or states of possible conduct
   3.8.3. intellectually observed;
   3.8.4. internal to consciousness;

3.9. as integrated and conducted well;

3.10. in the knowing process.

**Outcome of Critique**

From the perspective of experiential philosophy of educology, the main outcome of the critique is that the analytical philosophy of educology and phenomenological philosophy of educology perspectives are shown to be limited in that they disassociate, by excluding, the psychical aspects, i.e. psychical events, from the logical aspect, i.e. logical state, in consciousness by the conduct they purport to integrate and conduct well, hence, providing an inappropriate model for conduct to be well integrated into the educational process, whereby:

1. from the analytical philosophy of educology perspective it is conduct of verification thinking experiences;
   1.1 involving the conduct of reduction;
   1.2. by following the rules of symbolic logic, and;
2. from the phenomenological philosophy of educology perspective it is the conduct of the conscious formation of consciousness;

2.1. involving the conduct of reduction;

2.2. by following the rules of systematic phenomenology, and;

in contrast;

3. from the experiential philosophy of educology perspective it is the conduct of reflective thinking experiences;

3.1. involving the conduct of eduction;

3.2. by following the principles of;

3.2.1. discovery thinking experiences, in conjunction with;
3.3.1. verification thinking experiences.

The Significance of Work to be Done in the Future

From the perspective of the Institute, the work to be done in the future in philosophy of educology, as stated earlier, is that of meeting two challenges, i.e:

Challenge 1: the philosophical challenge of clarifying the nature of educological knowledge, i.e. of educology and its subject matter of the educational process, and;

Challenge 2: the philosophical challenge of critiquing the conduct of reflective thinking experiences;

2.1. as the conduct that integrates, well, the organization of conditions in which the knowing process is conducted, hence, the logic that when conducted well produces the body of educological knowledge, and, also that produces all other bodies of knowledge, and;

2.2. as the conduct of reflective thinking experiences, functioning as a model for the conduct of educative experiences, ought to be better integrated into the organization of conditions in which the educational process is conducted.

The significance of this future work, from the perspective of the Institute:

1. will be to continue to show the limitations of the analytical and phenomenological philosophy of educology perspective being connected to their logics and psychologies of reduction, as;

1.1. the psychical aspects, in conscious reflective thinking experiences, being disassociated, by exclusion, from the logical aspect, of conscious reflective thinking experiences, then;

1.2. disassociating, by excluding, hence, preventing;

1.2.1. the imaginative, emotional, conative, and volitional aspects involved in discovery thinking experiences, from being conjoined with;
1.2.2. cognitive thinking experiences involved in verification thinking experiences, and, in the conscious formation of conscious thinking experiences, in;
1.2.3. reflective thinking experiences;
1.2.4. being conducted and integrated well, into;
1.2.5. the knowing process, therefore;

2. will be to continue to show the frontiers of the experiential philosophy of educology and its conduct of eduction, as;

2.1. associating, by including, hence, developing;
2.1.1. the imaginative, emotional, conative, and volitional aspects, as the psychical aspects of conscious discovery thinking experiences, being conjoined with;
2.1.2. cognitive thinking experiences, as the logical aspect of conscious formation of conscious, and, verification thinking experiences, as

2.1.3. two necessary stages of reflective thinking experiences;
2.1.4. being conducted and integrated well, into;
2.1.5. the knowing process, therefore,

2.2. being a model for educative experiences;

2.2.1. being conducted and integrated well, into;
2.2.2. the educational process.

The significance of future work in experiential philosophy of educology, in meeting its two challenges, then, is that it will provide a body of knowledge for a profession, as referred to by the meanings, for example, of such words as ‘the profession of teaching’, ‘the profession of school teachers’, ‘the profession of school administrators’, ‘the profession of school counselors’, and, could and should be referred to by the meaning of the words ‘the profession of educologists’.

The significance of further work, then, will be that of providing for the profession of educologists to have a body of knowledge which can and will provide perspective and confidence so that “the profession” can and will have the kind of political influence it needs to arrange for the organization of conditions in which educative experiences are well integrated and conducted in the educational process of educational institutions, e.g. home, school, and community educational institutions, as modeled after reflective thinking experiences being well integrated and conducted in the knowing process.

Notes


“Also, in Europe pioneering work in educology has been, and is being done, by Professor Kestutis Pukelis at Vytautas Magnus University since 1991 in Lithuania.”

has been modified to state that:

“Also, in Europe pioneering work in educology has been done by Professor Leonas Jovaisa, recently retired from Vilnius University, and is being done by Professor Kestutis Pukelis at Vytautas Magnus University, Kaunas, Lithuania and Professor Lilija Duobliene at Vilnius University, Vilnius, Lithuania, since 1991 in Lithuania.”

Therefore, Version 2 includes Professors Jovaisa and Duobliene, along with Professor Pukelis, as doing pioneering work in educology in Lithuania.

1.2. In the 2005 Vol. 19 African Special Issue the above two statements are modified, by the following statement:

“Also, in Europe, before the 1991 Lithuanian Revolution, pioneering work in and about educology was done by Professor LEONAS JOVAISA. Professor Jovaisa suggested using the new term ‘educology’ and argued that when the limits of some scientific term are overstepped we need a new term, hence, because the limits of pedagogy have been overstepped by being considered to be applied psychology, the new term ‘educology’ is needed.

Professors Pukelis and Duobliene, then, have continued to use and extend the term ‘educology’ since the 1991 Lithuanian Revolution.”

This statement constitutes Version 3 of the Recurring Editorial.
1.3. Version 4 is a modification of Version 3 and is one made beginning in the 2006 issues of cd-IJE. This modification is from the perspective of experiential philosophy of educology to be, generally, that of considering the experience of the conduct of the interests of logic, psychology, problematics, and methodology, rather than just logic and psychology, as the experience of the conduct of disciplines constituting educology.
Special Account of
cd-IJE’s Perspectives on Education as Educology

James E. Christensen, Editor, Perspectives on Education as Educology
as reformatted by
James E. Fisher and Andrius Sprindziunas, Co-Editors, cd-IJE


cd-IJE (CD formatted), along with e-IJE (electronic formatted), is a publication of Educology Research Associates/USA (ERA/USA), through its initiative of the Institute for History and Philosophy of Educology for Developing Democracies in the World (the Institute). The 2005-06, issues of cd-IJE are constituted as a reformating of the book Perspectives on Education as Educology, whereby, the reformating is done by James E. Fisher and Andrius Sprindziunas, Co-Editors of cd-IJE and e-IJE.

Reformatting the book for publication, as cd-IJE’s Perspectives on Education as Educology, involved that which was necessary for constituting it in CD format, within the budget restrictions of ERA/USA, hence, each page of the book was scanner copied, OCR transformed, edited, PDF produced, and postal mail and electronically marketed from the home office of ERA/USA by the co-editors. The ERA/USA home office website is www.era-usa.net and the e-IJE electronic address is www.msnusers.com/IJEFile.

The reformating of the book for publication as cd-IJE’s Perspectives on Education as Educology has had no effect on the original content of the book. Apologies are in order, however, for effects the scanning, OCR transforming, editing, and PDF producing has had on the physical characteristics of the content. For example, some pages in the reformating work are pages that end with repeated periods, i.e. ‘……………………’, indicating that in the physical aspect of the reformating work, the end of the page in the book does not correspond exactly as it ends in the journal.

Why publish cd-IJE’s Perspectives on Education as Educology in the 2005-06 issues of cd-IJE can be understood, especially, after considering Christensen’s account of why the book was published in the first place. In the Preface to the book, after tracing the history of the developments of educology from 1951 to 1977, Christensen says:

“As I followed these developments, it became apparent to me by 1977 that the literature which used the term, ‘educology’, had been developed sufficiently to merit publication of a collection of essays which discussed the origin of the term, its different conceptions, the implications of those conceptions, and their utility. Thus, the initial steps were taken to contact contributors for this book.” (Preface pg. vii)
About the contributors, Christensen says:

“One common factor which links them together is that they distinguish between education as a process and the conception about this process. A second factor is that they argue that the conception can have a disciplined form, thus the conception can produce knowledge about education.” (Preface pg. vii)

Christensen continues by saying:

“This book is written in the tradition of works such as: Ivor Morrish’s Disciplines of Education (London: George Allen and Unwin, 1976); John Walton and James L. Kueth’s The Discipline of Education (Madison: The University of Wisconsin Press, 1963; Marc Belth’s Education as a Discipline (Boston: Allyn Bacon, Inc., 1965); John Walton’s Introduction to Education: A Substantive Discipline (Waltham, Massachusetts: Xerox College Publishing, 1971); and Wilhelm Sjostrand’s Education as an Academic Discipline (Uppsala: Universitet, 1967). The substance of this book, however, extends beyond previous work in at least two significant ways: It offers a set of arguments that an appropriate name for knowledge about the process of education is the term ‘educology’. And it discusses the structure, content, and uses of that knowledge. As such, the discussion explicates the syntactics, the semantics, and the pragmatics of educology. These three dimensions of educology constitute its logic, and they establish the basis for conducting disciplined inquiry about education.” (pgs. vii-viii)

Since Christensen’s acknowledgement of the growth of literature in and about educology in 1977, it continues to grow in 2005. Especially in Lithuania, East Europe, literature in and about educology, departments and divisions of educology, and courses and degrees in educology continue to grow, seemingly, out of the work of L. Jovaiša in the books Introduction to Educology (1993) and ABC’s of Educology (1993) and K. Pukelis in his books and articles published in Lithuania. As well, ERA/USA, through the Institute, continues to publish work in and about educology through cd-IJE and e-IJE, and will be publishing books in and about educology.

Note

It is worthy to note that since Christensen’s work, the discernment between analytic, systematic phenomenological, and experiential philosophies of educology have been made at the Institute, whereas, his work is considered, essentially, to be in analytic philosophy of educology. This consideration, however, in no way detracts from Christensen’s work. At the Institute his work is marveled at in respect to how much he contributed in such a short time. Without his work, philosophy of educology could not have arisen upon the grounds from which it sprang.

Apologies

The Co-Editors of cd-IJE and e-IJE extend their apologies for errors made in the reformatting work of scanner copying, OCR transforming, and editing of the content of the book Perspectives on Education as Educology, as it is involved in the publication of the 2005 and 2006 issues. Such reformatting work requires much technical knowledge about computers and computer programs and about the grammar and composition of other than the English language, specifically, in this case, in German, Dutch, Lithuanian, and Russian languages. Hence, educative experiences by the Co-Editors were constantly engaged in, especially, in the content of this kind of technical knowledge.
We stand accountable for such errors and when detected by readers we would greatly appreciate being contacted through fisher_james@msn.com, the e-mail address of ERA/USA.
Comment by George F. Kneller, with his own editing of it left to preserve the uniqueness of the comment.

-PERSPECTIVES ON EDUCATION AS EDUCOLOGY-
by James E. Christensen

Please include your affiliation

Comments: James E. Christensen's anthology is a discussion, from many points of view, of the nature, uses, and justification of educology. Prof. Christensen helps the reader greatly by introducing each paper, relating it to others, and explicating its terms. This book should stimulate much interest in the growing specialty of educology. It undoubtedly is a "first" in its field to attempt a comprehensive account, and succeeds in doing so.

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1. The copyright to chapters 3 and 7 shall be retained by the author, Anton Monshower, for publication in the Dutch language.
2. The copyright to chapter 9 shall be retained by the author, James F. Perry.
Dedication

To
Lowry W. Harding,
for his
good humor, wit,
and
pioneering work
in
educology
The conception which laid the foundations for this book began in 1973. I was an Assistant Professor in the College of Education at Southern Illinois University, Carbondale. The Dean of the College had distributed a memorandum to the faculty to solicit our ideas for reorganizing the College. A group of us in my department had a casual conversation about how we might rearrange the College if we had a free hand in the matter. One of my colleagues said that he would organize it according to function: The main function of the College was the professional preparation of teachers, counselors, school administrators, guidance specialists, and the like. Thus, he would have departments of teacher education, counseling and guidance education, school administration, and so forth. A second colleague said that he would use historical precedent: He would follow John Dewey’s recommendations on how to organize a College of Education.* A third colleague said that he would use educology to organize the College. “Educology means knowledge about the teaching and learning process,” he argued. Sort out the different kinds of knowledge that are possible about education and organize the curriculum and faculty in accordance with the different kinds of knowledge offered in the curriculum and taught by the faculty,” he continued. Thus it was that I was introduced to the concept of educology: knowledge about education. The idea intrigued me so much that I undertook to find out the origin of the concept of educology and to delve into the literature that used the term. My teacher and guide in my inquiries was my colleague, Professor James E. Fisher. He had studied under Professor Elizabeth Steiner at Indiana University for his Ed.D. in Philosophy of Education, and he introduced me to her work on relating the philosophy of science to the philosophy of education. Her benchmark article for the development of educology was, “Logic of Education and Educatology: Dimensions of Philosophy of Education,” Proceedings of the 7tentieth Annual Conference of the Philosophy of Education Society (Lawrence, Kansas: P.E.S., 1964). In her paper, she used ‘educatology’, but in response to criticism and recommendations at the P.E.S. meeting, she shortened the term to ‘educology’. Her subsequent work in explicating the concept of educology included: “Toward Educational Theorizing Without Mistake,” Studies in Philosophy and Education, Vol. 7 (1970) pp. 154-7; “Philosophy of Education as Philosophy of Educational Science,” Viewpoint, Vol. 47 (1971), pp. 1-8; ‘The Non-Identity of Philosophy and Theory of Education,” in Readings in Philosophy of Education, John Martin Rich, editor, 2nd Edition (Belmont, California: Wadsworth Publishing Co., 1972), pp. 360-371. Until 1975, I had believed that Professor Steiner had been the first to have used the term, but in that year, Professor William Eaton (Southern Illinois University, Carbondale) and Gregory Pozovich (a graduate student at S.I.U.) pointed out in a short paper delivered to the American Educational Studies Association that Professor Lowry W. Harding…………………

* In an unpublished memorandum written while at the University of Chicago (1897), Dewey made some proposals for the organization of a Department of Pedagogy. This was what my colleague had in mind. The memorandum is reproduced in Charles Brauner s American Educational Theory (Englewood Cliffs, New Jersey: Prentice-Hall, 1964), pp. 319-522.
of Ohio State University had coined the term as early as 1951. In fact, Harding had published four books using the term, and he played the role of principal figure in a loosely formed organization called, “The Association for the Study of Educology,” at Ohio State University. (To qualify for membership, one had to contribute a witty story or a joke that related to education.) The four books were: *Anthology in Educology* (Dubuque, Iowa: Wm. C. Brown Co., 1951); *Essays in Educology* (Dubuque, Iowa: Win. C. Brown, Co., 1956); *More Essays in Educology* (Columbus, Ohio: Association for the Study of Educology, 1964); *Educology: The Fourth Collection* (Columbus, Ohio: Association for the Study of Educology, 1965). In all of these works, Harding treated educology as a joke, a format for witty anecdotes about education, although there was the occasional suggestion that underneath the wit, Harding was serious about the idea of developing a fund of knowledge about education and calling it educology. The books were of limited edition. They were never intended to be widely distributed, and consequently, knowledge of them was confined largely to Harding’s students and friends. In contrast to Harding, Steiner was unequivocally serious in her writings on educology. She had coined the term independently of Harding and without knowledge of his treatment of the term. Moreover, her conception of educology related explicitly to problems of the logic of inquiry about education and the conditions of knowing about education. By 1977, I had become aware of two other scholars who had coined the term independently of Harding and Steiner: Professor John B. Biggs of Newcastle University (N.S.W., Australia) and Professor Rachel Elder of Pepperdine University (Los Angeles). Biggs used the term in a paper presented to the Annual Conference of the South Pacific Association for Teacher Education (Macquarie University, Sydney, 1975): “Professional Development or Practice.” He also used the term in a subsequent article: “Educology: The Theory of Educational Practice,” *Contemporary Educational Psychology, W*.1 (1976), pp. 274-284. Elder had coined the term in the late 1960’s and used it in a paper written for Far West Laboratory for Educational Research and Development (San Francisco): “Three Educologies” (Mimeographed, 1971). She was using the ten, in the sense of ideologies about education in order to stimulate students at the University of California, Berkeley, in the activist days of the late 1960’s to clarify their own ideologies as a basis for action in the task of teaching. Before knowing about Harding, Biggs, and Elder’s work, and in response to Steiner’s conception of educology, Professor Fisher and I were working in the mid-1970’s on developing our understanding of the implications of the concept. One of our initial works was the paper “The Logical Structure of Educational Studies (Educology) as an Organization for Curriculum and Administration in Colleges of Education,” presented to the Annual Conference of the American Educational Studies Association, New York City, 1974. In 1973, Professor Fisher organized a symposium at the Annual Conference of the American Educational Studies Association (San Francisco, California) which addressed the question of whether the A.E.S.A. should change its name to the M3erican Educology Association. Papers included in this symposium were: “The History of the Term, ‘Educology’,” by William P. Eaton and Gregory J. Pozovich of Southern Illinois University, Carbondale; “Considerations for Naming a Professional Association,” by Professor Jerome A. Popp of Southern Illinois.
University, Edwardsville; “Educology and the Categories of Educational Studies,” by Professor Fisher; “A Conversation About Education and Comparative Education as Educology,” by myself. In that same year, I presented a paper to the Australian Association for Research in Education (Adelaide, South Australia) with the title, “Educational Research as Educology.” Two years later, in 1977, Professor John Martin Rich presented a paper to a joint meeting of the Society for Professors of Education and the Philosophy of Education Society (“The Moral Domains of the Education Professoriate”) in which a criticism was made of Professor Steiner’s conception of educology and a delineation was made of the moral dimensions for educology. Also in 1977, at the Annual Meeting of the American Educational Research Association in New York City, a symposium was held on the question of “Whither or Wither Educology?” The Chairman was Professor George Maccia of Indiana University, Bloomington, and the papers which addressed the question included: “Educology: Its Origin and Future” by Professor Elizabeth Steiner of Indiana University, Bloomington; “Educology and Educational Theory Construction” by Professor Richard E. Snow of Stanford University; “The Relevance of Educology for Educational Practice” by Professor Russell Ames of Purdue University; “Educology and Educational Policy Making” by Professor Kenneth Strike of Cornell University. As I followed these developments, it became apparent to me by 1977 that the literature which used the term, ‘educology’, had been developed sufficiently to merit publication of a collection of essays which discussed the origin of the term, its different conceptions, the implications of those conceptions, and their utility. Thus, the initial steps were taken to contact contributors for this book. The first obvious contact to make was Elizabeth Steiner. It was through her that I learned of the interest that educology had generated among a community of scholars in Europe as well as in the United States. The set of scholars who ultimately agreed to make contributions to this book, then, are a diverse group. Some are former graduate students who studied with Steiner and who have extended the implications of educology. Others are scholars who responded to Steiner’s works. And others are scholars who worked independently and unaware of Steiner’s work. One common factor which links them together is that they distinguish between education as a process and conception about that process. A second factor is that they argue that the conception can have a disciplined form, thus the conception can produce knowledge about education.

This book is written in the tradition of works such as: Ivor Morrish’s Disciplines of Education (London: George Allen and Unwin, 1976); John Walton and James L. Kuethe’s The Discipline of Education (Madison: The University of Wisconsin Press, 1963; Marc Belth’s Education as a Discipline (Boston: Allyn and Bacon, Inc., 1965); John Walton’s Introduction to Education: A Substantive Discipline (Waltham, Massachusetts: Xerox College Publishing, 1971); and Wilhelm Sjostrand’s Education as an Academic Discipline (Uppsala: Universitet, 1967). Like these previous works, it (i.e., Perspectives on Education as Educology) distinguishes between education as a process, on the one hand, and education as a fund of knowledge about that process, on the other. The substance of this book, however, extends beyond previous work in at least two significant ways: It.................................
PREFACE

offers a set of arguments that an appropriate name for knowledge about the process of education is the term, ‘educology’. And it discusses the structure, content, and uses of that knowledge. As such, the discussion explicates the syntactics, the semantics, and the pragmatics of educology. These three dimensions of educology constitute its logic, and they establish the basis for conducting disciplined inquiry about education.
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INTRODUCTION

EDUCATION AND EDUCOLOGY

Occurrences are distinct from discourse about them. And educational occurrences are not the same as statements made about them. It is the business of educational researchers to construct language (sets of statements) that adequately characterizes education. To adequately characterize is to accurately describe, explain, and predict that which occurs in the educational process. Language which adequately characterizes education is knowledge about education. Terms which are candidates for naming this knowledge include ‘pedagogy’, ‘ethology’, and ‘educoology’. ‘Pedagogy’ has been in use since the eighteenth century, and the term is derivative of the Greek term, ‘paidos’, meaning children. The concept of pedagogy relates closely to knowledge about the education of children, hence it is too narrow in its conception to include knowledge about all levels, functions, and forms of education. ‘Ethology’ is derivative of ‘ethos’, meaning character of a group. The concept of ethology relates to knowledge about the character development of societies and nations. (It was John Stuart Mill who advocated the use of this term.) As such, ethology implies more than knowledge about education. Its implications include knowledge about all leaning (deliberate, guided, and unintentional, unguided, adventitious). thus, the concept of ethology is too broad for the term to be used to mean, and only mean, knowledge about education. The term, ‘pedagogy’, means less than knowledge about education. A third candidate yet remains: the term ‘educoology’. It is derivative of the term, ‘education’, meaning the process of someone guiding and someone else being guided in learning something. The concept of educoology means, and only means, knowledge about education.

Educoology and, by necessary implication, knowledge about education relate to conception about education. The expression of our conception about education is achieved in language, i.e., in sets of sentences. Adequate conception about education is implied by adequate expression. i.e., by sets of sentences which accurately, clearly, and thoroughly characterize education. The sets of essays which constitute the chapters of this volume are expressions of conception about education, for example. Where these expressions are adequate, they are educoology (i.e., sets of true statements about education, or knowledge about education).

The discipline of educoology is to be distinguished from educoology, itself. The discipline is the set of standards by which researchers judge whether appropriate, necessary, and sufficient evidence exists to warrant judging a set of statements true. Out of all statements about education, that set which is true is educoology. The set of standards for judging the truth value of those statements is the discipline of educoology. That set of standards includes the standards for judging the truth value of (i) analytic, (ii) empirical, and (iii) normative statements, for all three categories of statements can be made about education.³ made by necessary implication, all three types of knowledge can be formed about education.

The idea of research methodologies for educational inquiry relates………………………………
INTRODUCTION

to the discipline of educology. Research methodologies can be classified in accordance with whether they are directed toward amassing evidence to support (i) analytic, (ii) empirical, or (iii) normative knowledge claims. So, the discipline of educology does not imply a single standard for judging the truth value of knowledge claims about education, e.g., the standards relating to empirical claims), but rather, it implies a set of standards which includes at least three subsets: those for analytic, empirical, and normative claims. The discipline of educology, therefore, is much more complex than, for example, the discipline of mathematics (which implies the standards for judging analytic knowledge claims only), or that of physics (which implies the standards for judging analytic and empirical knowledge claims).

At this point, it is important to note that different bodies of knowledge can imply the same discipline (i.e., standards of proof). Hydrology and botany, for example, are bodies of knowledge arranged with respect to the object of knowledge. The object is that about which the set of true statements is stating. The set of true statements which is botany states about plants. The set of true statements which is hydrology states about water. Plants and water are objects of knowledge (or fields of phenomena). Yet, the discipline of hydrology and that of botany are the same, in the sense that both imply the standards required for judging empirical and analytic knowledge claims. In this sense of discipline, the bodies (or funds) of knowledge named ‘sociology’, ‘anthropology’, and ‘educology’, for example, share the same discipline, i.e., the same categories of standards for judging the truth value of knowledge claims. They differ with respect to their object of knowledge: For sociology, the object is society; for anthropology, it is mankind; for educology, education.

Knowledge arranged by its object, as is sociology or educology, is to be distinguished from systems of knowledge. Knowledge arranged in a system permits generalization: The greater the coherency of a system of knowledge, the higher the level of generalizations that are possible. Physics, that body of knowledge so often pointed to as an example of a system of knowledge, is a set of statements with a high degree of coherency (and thus, system). Yet even this popular paradigm of systematic knowledge is not entirely systematic. The set of sentences which relate magnetic forces, electrical forces, and atomic forces, have not yet been arranged such that the set of sentences can relate gravitational forces to the other three. The point being made here is that there are degrees of systematization, and even those categories of knowledge (i.e., sets of true statements) with a high degree of systematization (such as physics and chemistry) are not entirely systematized.

Systemization of knowledge is, of course, highly desirable, for it permits ever wider generalizations and ever wider accurate predictions. Yet systemization does not constitute a discipline. And this brings us back to the point at which the discussion of system being: Systemization of knowledge is distinct from discipline of knowledge. Systemization relates to the arrangement of sets of true statements into a coherent order.
Discipline of knowledge relates to the standards requisite for judging the truth value of knowledge claims. The presence (or absence) of system in a fund of knowledge (such as educology) has a direct bearing upon the utility of the knowledge: The higher degree of system, the greater the utility. Yet the presence (or absence) of system in a fund of knowledge has no bearing on its truth value. The discipline of a fund of knowledge, however, does, for its the discipline (or standards) which must be used in order to determine whether a set of statements do constitute knowledge (i.e., are true).

The important points in this discussion thus far are:

(i) Education is the process of someone guiding and someone else undertaking to be guided in learning something.

(ii) Educology is a term which means, and only means, knowledge about education. This knowledge is the set of true statements that are related with respect to the object (i.e., the field of phenomena) that they state about: viz., education.

(iii) The discipline of educology is the set of standards that are required to judge the truth value of knowledge claims (sets of statements) about education. The standards of proof for knowledge about education are not the same as knowledge about education. Thus, the discipline of educology is not the same as educology.

(iv) A system of knowledge is a set of true statements that are ordered so that they are coherent with each other.

One more important distinction is required to round out this introduction to educology. The role which educational researchers play can be characterized as one of doing educology. The expression, ‘doing educology’ is an elliptical way of indicating the set of inquiry activities which produce the true statements about education. The expression, doing educology’ then, means conducting inquiry that produces educology. It is equivalent in meaning to the expression, ‘producing educology’, and this latter expression would be a less figurative, but explicit and correct way, of characterizing all successful inquiry about education.

The argument, in fact, can be extended to inquiry about phenomena that are not denoted by the term, ‘education’. That is, instead of doing sociology, or doing zoology, or doing botany, in the sense of engaging in the activity of successful inquiry about society, animals, or plants, it would be correct to indicate the activity of successful inquiry with the expression, ‘producing sociology’, ‘producing zoology’, or ‘producing botany’.

The chapters which follow in this volume are expressions of conception about education. Among the problems that are addressed are:

(i) What is the difference between (a) education and (b) knowledge about education?
(ii) What set of standards (i.e., discipline) is requisite for judging the truth value of knowledge claims about education?

(iii) To what extent and by what means can knowledge about education be systematized?

(iv) What uses can be made of knowledge about education?

The treatment of these problems varies with the conceptions of the various authors. The main factor which relates the arguments in each of the chapters is the distinction that is made between (a) education as a set of natural phenomena and (b) conception, expressed as statements, about that set of natural phenomena. That distinction is kept constant and clear throughout by the use of the term, ‘education’, to denote phenomena, and the use of the term ‘educology’, to denote conception as statements about phenomena.

Education =

the process of = a set of = an object = a set of
someone guiding = occurrences = of = objects
and someone else = (a field of = knowledge = which
undertaking to = phenomena) = can be
be guided in = characterized = by true
learning = statements
something

Educology =

sets of true = knowledge = knowledge = sets of true statements
statements = about = arranged = that adequately
about = education = by its = characterize
education = object

Discipline of Educology =

the set of standards = the set of standards
requisite for judging = requisite for judging
the adequacy of = the truth value of
knowledge claims = educology
about education

FIGURE 1.1
Distinctions Among Education, Educology, and the Discipline of Educology

4
INTRODUCTION

FOOTNOTES

1. Elizabeth Steiner has set forth the argument for ‘educology’ as a more adequate term than ‘pedagogy’ and ‘ethology’ in the O’Connor Lectures on Education delivered at Colgate University, Hamilton, New York, February-May, 1979. They are to be published under the title of Educology of the Free.


3. These relate to the distinctions made by Immanuel Kant in Critique of Pure Reason among a priori and a posteriori, analytic and synthetic knowledge, but they are not identical with Kant’s distinctions. Analytic knowledge requires the evidence of logical objects and the use of the principle of necessity reasoning. Empirical knowledge requires the evidence of physical objects and the use of the principle of observation. Normative knowledge requires the evidence of logical objects and the evidence of human action and the use of the principle of evaluative reasoning. These distinctions are further explained and illustrated in Analytic Philosophy of Education as a Sub-Discipline of Educology by J. E. Christensen and J. E. Fisher (Washington, D.C.: University Press of America, 1979).
CHAPTER 10

INSTRUCTIONAL SCIENCE AND TECHNOLOGY:
THEIR CONTEXT WITHIN EDUCOLOGY AND SOME IDEAS FOR THEIR
FUTURE DEVELOPMENT

Charles M. Reigeluth and M. David Merrill

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TRANSITION: One category of knowledge about education that is possible
is knowledge about effective practices in education. A possible name
for knowledge about effective practices is 'praxiology'. And possible names
for the concept of 'knowledge about effective educational practices' are:
praxiology of education, educational praxiology, and praxiological educo-
logy. In the previous three chapters, arguments have been presented for
the development of this category of knowledge, and explications have been
given of some of the implications of the concept. In this chapter, Rei-
geluth and Merrill present the results of some of the empirical and con-
ceptual work which they have conducted toward extending knowledge about
effective practices in education.

In Chapter 10, the authors differ somewhat in their conception of
praxiological educology from that of Brezinka, Maccia, Steiner, Christen-
sen, and Perry. First, Reigeluth and Merrill do not distinguish clearly
between (1) true statements (knowledge) about effective educational prac-
tices and (2) the effective educational practices themselves. Second,
they conceive of science of education as generalizations and praxiology
of education as applications of those generalizations. (In their con-
ception of science of education, they thus use the term in a way that is
close to Monshower's use.) Steiner et al. conceive of science of edu-
cation to be generalizations and also praxiology of education to be gen-
eralizations; programs for action are not derivable from the generaliza-
tions of science, but they are from the generalizations of praxiology.

Thus, the conception of 'science of education' that is followed in
Chapter 10 is closest in meaning to the concept of 'praxiology of educa-
tion' that is followed in previous chapters. The sense of 'praxiology
of education' that is followed in Chapter 10 is 'effective educational pro-
cedures', a concept close, but not identical in meaning to the concept
of 'technics' developed by Monshower in Chapter 7. This concept is to
be contrasted with Steiner's conception, for example, in which effective
educational procedures are the actual programs derived from praxiological
generalizations. Praxiology, in her conception, is the generalizations,
and a program is an arrangement of a set of effective actions. 'Instruc-
tional science and technology' in Reigeluth and Merrill's usage is clos-
est in meaning to 'instructional praxiology and programs' in Steiner, Bre-
zinka, Maccia, Perry, and Christensen's usage, and to 'instructional tech-
nology and technics' in Monshower's usage.
INTRODUCTION

Instructional science and instructional technology are but two fields within the discipline of educology. They are both dedicated to improving the methods of instruction, and they do not in any way imply a "mechanistic" system of education in which no importance is attributed to human interaction, imagination, and creativity. Instructional science is a field dedicated to the discovery of principles and theories about methods of instruction. It is concerned with the identification of the causes of different instructional outcomes under different conditions and with the explanation of the effects of different instructional methods under different conditions. Instructional technology is a field dedicated to the development of procedures for applying scientific knowledge of instruction to the solution of practical problems in education and training. We will elaborate upon and illustrate these definitions below.

In this chapter, we will (1) discuss the context of instructional
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science and instructional technology within the discipline of educology, (2) discuss the importance of instructional science and technology for improving the effectiveness, efficiency, and appeal of methods of instruction, (3) describe the fundamental nature of instructional science and of instructional technology (or praxiology), (4) propose seven activities as a procedure for the continuing development of instructional science and instructional technology, (5) describe some related work that authors have done in those seven activities, and (6) discuss some of the most important areas for work on further developing these important fields of educology.

THE CONTEXT

J. Christensen and J. Fisher have identified and described a variety of fields within the domain of educology. They argue that educology implies: (1) analytic studies about education, which include history of education, analytic philosophy of education, and jurisprudence of education; (2) normative studies about education, which is normative philosophy of education; and (3) empirical studies about education, which include science of education, praxiology of education, and political praxiology of education. According to these categories, instructional science and technology (or praxiology) lie exclusively within the area of empirical studies about education.

However, instructional science and instructional technology are not the same as Christensen and Fisher's science of education and praxiology of education, respectively. Education is a broader term than instruction; hence the area of empirical studies about education includes other aspects of education (such as administration) besides instruction. Instructional science and technology lie exclusively within the area of empirical studies about instruction.

IMPORTANCE OF INSTRUCTIONAL SCIENCE AND TECHNOLOGY

The purpose of the science and technology of instruction is to improve the quality of methods of instruction that are used in education and training. In spite of a broad concern for improving the quality of education, surprisingly little is being done to develop the knowledge base that is necessary for improving the methods of instruction, especially when considered in relation to the total resources devoted to education. The National Council on Educational Research states that one-half of one per cent of the total annual expenditure on education was allocated for increasing education's knowledge base in 1976, compared with five per cent of agriculture's total and ten per cent of industry's total being allocated to research. And of the total expenditure for increasing the knowledge base for education, a surprisingly small proportion is allocated to developing a knowledge base for improving the methods of instruction.

Certainly many things are needed to improve the quality of public
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education: better training of teachers, better design of facilities and media, better home study environments, better administrative procedures, and much more. But from a purely instructional point of view, the two most fundamental factors are: (1) improving what is taught, and (2) improving how it is taught. The first factor is most strongly influenced by subjective values.

This discussion addresses only the second factor -- improving the methods of instruction -- because it can be, and should be, most strongly influenced by an appropriate scientific and technological knowledge base.

THE NATURE OF INSTRUCTIONAL SCIENCE AND TECHNOLOGY

But what is this knowledge base for improving the methods of instruction? And what kinds of knowledge are needed? We need knowledge about the kinds of methods that will make learning easier and more fun for students -- methods that are more effective, efficient, and appealing. But in order to develop better methods of instruction, we must seek detailed knowledge about methods. Too often researchers investigate methods on too high a level of generality, such as "lecture" vs. "discussion group," "inductive" vs. "deductive," and "discovery" vs. "reception." Methods at such a high level of generality often vary as much within each category as between categories. Therefore, it is important to break down such methods into their building blocks and to study the effects of each of those more precise and clearly defined strategy components, separately and in various combinations, and under a variety of different conditions.

For example, suppose we want to teach a student a concept. This means the student must learn to classify previously unencountered examples and nonexamples of that concept -- for instance, he or she must learn to distinguish cars from vehicles that are not cars. It has been shown that presenting the student with examples that are widely different (divergent) from each other -- such as big Cadillacs and little Renaults -- will help prevent the student from undergeneralizing -- that is, from saying that a little Renault is not an example of the concept of the term, 'car', when in fact it is. It has also been shown that presenting the student with a clearly labeled "matched nonexample" (i.e., something that is not an example of the concept) together with the example to which it is matched -- such as a pickup truck that is similar to a car in size and color -- will help prevent the student from overgeneralizing the use of a term -- that is, from saying that a pickup truck is an example of something that should be denoted by the term, 'car'.

Divergent examples and matched nonexamples are two clearly defined, elemental, strategy components for which an investigator can identify reliable cause and effect relationships. But such a "scientific approach" to understanding instruction should not be confused with a mechanistic or nonhumanistic approach to giving instruction. Such a scientific approach merely affirms that certain things that a teacher or textbook can say will have certain predictable effects on students' understanding. A
teacher can be just as warm and human, in fact he or she can be more so, when the teacher understands which strategy components will help most to solve different types of student learning problems or errors.

Therefore, a fundamental assumption behind our discussion of a scientific and technological knowledge base for improving our methods of instruction is that different strategy components can have different and consistent effects on the outcomes of instruction. We are not saying that all strategy components do have different and consistent effects on instructional outcomes. In fact, this is why one of the major tasks confronting us is to identify, describe, and clearly characterize the kinds of strategy components that do have consistent effects (e.g., the use of matched nonexamples and divergent examples in the teaching of concept classification tasks) and reject those that do not have consistent effects.

A corollary of the fundamental assumption that different strategy components can have different and consistent effects on the outcomes of instruction is that different conditions can have consistent influences on those effects. An increasing amount of research is being done on the ways in which the effects of a method of instruction vary for the different types of students. Unfortunately, most of this research is done on general methods rather than on more precise strategy components. But type of student is not the only kind of condition that influences the effects of instructional strategy components and methods, nor is it necessarily the most important kind of condition. Type of subject matter content shows indications of being just as important. Unfortunately, relatively little work has been done in this area.

Therefore, the knowledge base that is needed for improving how things are taught must include both the identification of new strategy components (that have consistent effects) and the determination of any differences in their effects that may be caused by different conditions. These activities may be viewed as a science of instruction because they entail the discovery of cause and effect relationships, or principles and theories of instruction, which relate conditions, methods, and outcomes of instruction. But another aspect of the needed knowledge base is the development of procedures for applying the knowledge of principles of instruction (not to be confused with principles of learning) to the improvement of teaching.

This activity may be viewed as a technology of instruction (technology being defined as "applied knowledge") because it entails the development of ways for using the knowledge of instructional science for solving real-world problems -- it entails the development of application procedures for the principles of instruction. The term 'technology', as used herein, is synonymous with 'praxiology' as used by Christensen and Fisher and others in this volume.*

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*As already noted in the transition to Chapter 10, the editor disagrees with this assertion. It seems that Reigeluth and Merrill are among those whom Monshower has identified as scholars who do not distinguish between technology and technics.
INSTRUCTIONAL SCIENCE AND TECHNOLOGY

All technologies (e.g., medicine, engineering) are related to a science (e.g., biology, physics), which is comprised of clearly defined concepts and empirically validated principles (i.e., cause and effect relationships among those concepts). Those technologies are devoted to the development of procedures (either methods or machinery) for applying scientific principles. In instructional technology, there are as many types of application procedures as there are types of instructional problems. But some major types of application include: (1) procedures for teaching or designing instruction effectively, (2) procedures for diagnosing weaknesses in existing instruction, (3) procedures for improving existing instruction, and (4) procedures for rating existing instruction (i.e., predicting its effectiveness).

DEVELOPING THE SCIENCE AND TECHNOLOGY OF INSTRUCTION

Instructional science and technology are in their infancy. They are wide open and exciting fields sorely in need of bright, imaginative, and creative young people; and there are only six or eight graduate programs in these fields in the country. Since these fields are so new, we propose the following seven activities as a useful operating procedure for further developing the scientific and technological knowledge base for improving methods of instruction.

1. DEFINITION OF CONCEPTS. One of the greatest hindrances to deriving and communicating instructional principles and application procedures is the lack of an unambiguous definition of important concepts and variables, particularly those relating to methods of instruction. Therefore, a prerequisite to all other productive activities is the classification, precise definition, and unambiguous labeling of the phenomena related to instruction.

But there are many ways in which instructional methods and conditions can be classified, just as noninstructional phenomena like trees can be classified in different ways — according to their age (e.g., seedlings and saplings), their kind of leaf (e.g., pines and deciduous trees), their genus (e.g., oaks and maples), etc. The ultimate value of any classification scheme that we adopt for instructional phenomena is determined by the stability and magnitude of the cause and effect relationships that are found to exist among those categories. It is likely that progress in instructional science and technology will be related to the degree to which many currently used concepts such as discovery, deductive, and discussion, are replaced by more precise concepts and unambiguous terms. Unfortunately, there is much resistance to such a change, for many people naively think that all that is being changed is names — they do not recognize that there are and will be important new concepts for which there are no adequate names.

2. DERIVATION OF PROPOSITIONS. Having defined a vocabulary with which to describe the instructional process (Activity 1), it is possible
to make more precise statements about relationships observed in practice, about relationships derived from descriptive principles of learning, and about relationships which seem to logically follow from the variable scheme defined. Therefore, the second step in developing a knowledge base for improving our methods of instruction is to derive propositions (hypothesized principles) which state prescriptive relationships among strategy components (methods), conditions, and outcomes. Each of these propositions is a potential principle of instruction, but its validity as a principle must be demonstrated (Activity 3, below).

3. VALIDATION OF PRINCIPLES. The third activity is the testing of the propositions (derived from Activity 2) to find out whether or not each is a valid principle. Unless there is empirical support for the prescriptive relationship described by a proposition, it is of little value. But there are two important kinds of empirical support that can be obtained: 10 (1) Support from laboratory experiments investigating the isolated effects of one, or at the most just a few, strategy variables under conditions that are carefully controlled so as to reduce confounding variables; and (2) support from classroom experiments investigating the aggregate effects of complete sets of strategy variables under realistic conditions. In this activity we are interested only in laboratory experiments, because we want to verify individual, pure relationships (i.e., single principles). Complete sets of variables are tested later (Activity 5 below).

4. DEVELOPMENT OF MODELS. It is likely that some strategy components will have duplicate effects -- that is, when you have either of two components in the instruction, the other will contribute nothing. It is also likely that some strategy components will have interaction effects with other strategy components and/or with conditions -- for instance, adding one component may make another component have an opposite effect from before the former was added.

For these reasons, it is important to develop models (or theories) which prescribe combinations of strategy components that will optimize given types of outcomes for given sets of conditions. There has been some controversy over the viability of generalizable theories of instruction, but it is likely that models (or theories) which take account of different conditions can have a large degree of generalizability across schools and across time. 11

This activity will often be conducted simultaneously with, or even after, the next.

5. TESTING OF MODELS. Like propositions, models have little value unless empirical support can be obtained for them. Therefore the fifth activity is the testing and revision of the models. But, unlike research on single principles of instruction, research on prescriptive instructional
models seldom attempts to show that a model is or is not valid. Rather, it is directed at identifying an optimal set of strategy components for certain sets of conditions and desired outcomes. The authors have proposed a research methodology for doing this kind of research on instructional models.  

6. DEVELOPMENT OF APPLICATION PROCEDURES. The sixth activity enters the field of instructional technology. It entails the development of procedures for applying the principles and/or models to the solution of different kinds of instructional problems. These kinds of problems may include: (1) the design of new instructional materials, (2) the rating of the effectiveness and efficiency of existing materials, (3) the diagnosis of weaknesses in existing materials, (4) the improvement of existing materials, and (5) the teaching of self-instructional strategies to students. Application procedures provide a set of steps that a person may follow in order to solve a specific problem.

7. TESTING OF APPLICATION PROCEDURES. The seventh activity is the evaluation and revision of the application procedures. This is done by trying out the alternative procedures in real world applications and by comparing their effectiveness with their costs.

We propose these seven activities as a highly effective way to develop a scientific and technological knowledge base for improving the methods of instruction.

OUR RELATED WORK TO DATE.

Our basic approach to improving the methods of instruction is based on the assumption that different strategy components are optimal under different types of conditions and for different types of outcomes. Because of this assumption, our basic approach is to develop strategy components that will meet the instructional needs of different types of instructional conditions. Over the past five years (1973-78), M. David Merrill's laboratory (sponsored jointly by Brigham Young University and Courseware, Incorporated) has produced sizeable efforts in literature review, original theory construction, and systematic research. The following is a summary of our work to date.

1. BASIC CONCEPTS AND VARIABLE CLASSES. The authors have done some extensive work in the area of taxonomy construction. Briefly, all instructional variables belong to one of three categories: (1) methods, which an instructional designer or educator can manipulate in order to achieve specified outcomes under given conditions, (2) conditions, which can not be manipulated but which nonetheless influence the outcomes of methods by interacting with them, and (3) outcomes, by which methods can be evaluated under different conditions. Figure 10.2 shows the major categories.
A model showing classes of instructional variables and the major relationships among them.

**Figure 10.2**

- **Outcomes**
  - Institutional Spousal Rounding
  - Learner Outcomes
- **Methods**
  - Organizational Strategies
- **Conditioins**
  - Student Characteristics
  - Goals and Standards
- **Variables**
  - Instructional Strategies
  - Delivery Strategies
  - Management Strategies
  - Characteristic of Subject Matter and Content

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of instructional variables, and the major interrelationships among them, as we presently conceptualize them. (This figure does not depict the instructional process, nor does it depict the process of instructional design.)

Figure 10.2 also identifies major classes within each of these three categories. Methods are classified very differently from most current conceptualizations. Organizational strategy variables are components of methods for organizing the subject-matter content (including skills) that is to be taught. Delivery strategy variables are components of methods for conveying the instruction to the student. And management strategy variables are components of methods for arranging the interaction of the students with the organizational and delivery strategy components. This classification of instructional variables is described in detail elsewhere by the authors.\textsuperscript{14}

Within this scheme, the authors have done extensive work only on organizational strategies, which can be further classified as presentation strategies and structural strategies. Presentation strategy variables are components of methods for organizing the instruction on a single concept, principle, etc.; and structural strategy variables are components of methods for organizing (structuring) many related concepts, principles, etc. An extensive taxonomy of concepts related to presentation strategies is presented by Merrill and Wood,\textsuperscript{15,16} and a taxonomy of concepts related to structural strategies is presented by Reigeluth \textit{et al.}\textsuperscript{17}

2. PRINCIPLES OF PRESENTATION ADEQUACY. We believe that the effectiveness of a presentation strategy component depends primarily on the type of content involved, and the level of behavior at which the student is to learn that content. We have identified five types of content -- facts, subsets, concepts, procedures, and principles -- and (with the exception of facts) three major task levels at which each of these types of content can be learned -- remember examples, remember generalities, and use generalities on newly encountered examples (such as using a definition to classify examples and nonexamples of a concept). This task-content classification of subject matter is explained in greater detail elsewhere.\textsuperscript{18,19}

The task-content classification of subject matter is important for improving our methods of instruction, because it is the basis for predicting which presentation strategy components (i.e., methods for teaching a single concept) will be optimal under given types of instructional conditions. But this advance, as important as it is, represents only one part of the knowledge base necessary to improve the presentation adequacy of instructional methods. The other major part is the development of highly effective presentation strategies for each task-content type of subject matter.

We believe that considerable progress has been made recently on presentation strategies (i.e., strategies for teaching more than one con-
cept, principle, etc.). One of the major breakthroughs in the development of presentation strategies was the notion that all instruction can be broken down into different types of "displays" -- the elements of instruction.\textsuperscript{20} A display is a piece of instruction that contains a single kind of information. The most important displays are referred to as "primary presentation forms;" and they are: (1) generalities, such as definitions of concepts, (2) instances, such as examples of a concept, (3) generality practice, which is student recall or recognition of a generality, and (4) instance practice, which may require the student to remember an instance or to classify an instance as an example or nonexample of a concept. These four primary presentation forms are described in greater detail in several of our publications.\textsuperscript{21, 22, 23, 24}

The result of all these efforts has been the development of some prescriptive principles of instruction -- principles that relate certain instructional outcomes to certain instructional conditions and strategies. The following is a summary of the major principles of presentation adequacy that we hypothesize to be effective for high school and college students.\textsuperscript{25}

i. Presentation Consistency. The instruction on a single topic should be at the same task-content level as the goals and objectives of that instruction. Also, the corresponding set of test items should be at the same task-content level.

ii. Primary Presentation Form Selection. Instruction for "remembering an instance" should be comprised of only two of the primary presentation forms: (1) the instance, and (2) instance practice. Instruction for "remembering a generality" should be comprised of only: (1) the generality, and (2) generality practice. And finally, the instruction for "using a generality" should be comprised of only: (1) a generality, (2) instances, and (3) instance practice.

iii. Primary Presentation Form Sequence. Instruction for remembering an instance should always begin with the instance; and the instruction for the remaining task-content types should always begin with the generality. Other than that, the learner should be able to select the type of primary presentation form (e.g., instance or instance practice) that he or she thinks would be most helpful at any moment, including a review of the initial primary presentation form -- the generality.

iv. The Contents of Each Primary Presentation Form. The major components of each primary presentation form should be: (1) a fairly concise statement or question about the generality or the instance; (2) an alternative representation for the generality (e.g., a diagram or picture); (3) attribute isolation (highlighting, arrows, etc.) for the early instances and for all feedback at the use task level; and (4) separate helps for all four primary presentation forms (e.g., mnemonics for the
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remember levels, a reference instance with a description of its mapping to the generality for each generality at the use level, and a concise representation of the generality with a description of its mapping to the instance for each instance and for instance and for instance-practice feedback. The contents of each of these major PPF (primary presentation form) components have also been researched and specified to a large degree, but those contents vary with the type of content, i.e., principles, concepts, etc.

v. Quantity of Instances and Instance Practice. Written instructional materials should contain as many instances and as much instance practice as the slowest student will need. The learner should be permitted to select the amount of each that he or she feels is necessary to understand the topic. The effectiveness of this type of "learner control" depends on providing the student with the kinds of information necessary for him or her to make good decisions, such as a clear description of the kinds of variations in instances that he or she must learn at the "use a generality" level.

vi. Isolation. Each primary presentation form should be separate from the others and should be clearly identified as to which one it is (generality, generality practice, instance, or instance practice). The same applies to the major components of each primary presentation form -- such as, alternative representations, helps, etc.

vii. Instance Sampling and Matching. Instances and instance practice at the "remember an instance" level and at the "use a generality" level should be of a variety of representation forms and of a variety of difficulty levels. Instances at the "use a generality" level should also be divergent on variable attributes that the student ought to learn, and instances should be matched with instances of common errors (e.g., matched non-examples for concept learning). Some of these principles are explained in greater detail elsewhere.

The derivation of these principles is obviously very important, but our efforts go considerably beyond this in two ways. We have devoted considerable effort to (1) validating those principles (Activity 3), primarily for high school and college students, but to some extent for elementary and junior high school students also, and (2) developing procedures to facilitate the application of those principles to solving instructional problems (Activity 6).

3. VALIDATION OF PRINCIPLES OF PRESENTATION ADEQUACY. One of our first major efforts to validate the above-mentioned principles of presentation adequacy was a review of research literature. Also, we and
our associates have completed over 20 empirical research studies, and about 25 more studies are in various stages of completion, including studies on primary presentation form sequence, instance number, generality and instance helps, practice feedback, attribute isolation, learner control, and primary presentation form isolation. In no case has any study contradicted any of our proposed principles; all studies have either supported them or have shown no significant differences.

4. APPLICATION PROCEDURES FOR PRESENTATION ADEQUACY. The other major extension of our work is the development of procedures to facilitate the application of the above-mentioned principles of presentation adequacy to solving instructional problems (Activity 6). The development of procedures requires a completely different effort (at the technologist or engineering level) than does the development of prescriptive principles of instruction (at the scientist level), just as the development of prescriptive principles in the science of instruction requires a completely different effort than the derivation of descriptive principles in the science of learning. Procedures are simple step by step applications of one or more principles.

We recently finished a project to develop procedures for a limited application of a limited set of principles. The principles concern presentation adequacy for high school and college aged students, and the application was for the diagnosis and rating of existing instruction. Instruction in this limited set of procedures comprises The Instructional Strategy Diagnostic Profile Training Manual. A major part of the procedures is a set of forms that are used to profile weaknesses in the instructional materials and to rate their overall level of effectiveness with respect to presentation strategies. Lessons 4 and 5 in the manual show the kinds of step by step procedures that can be developed to implement some of the above-mentioned principles of presentation adequacy.

Another significant application of the above-mentioned principles of presentation adequacy is the instructional design procedures used by Courseware, Incorporated. These procedures are presented in Courseware's Author Training Course and Coursewriter's Workshop, but more importantly these procedures have been used extensively in the development of thousands of hours of written instruction.

5. TESTING OF APPLICATION PROCEDURES. The Instructional Strategy Diagnostic Profile Training Manual has recently undergone some formal validation studies (Activity 7) for the diagnosis and rating of existing written instructional materials. Also Courseware's use of instructional design procedures has provided extensive field testing of the procedures on many large (i.e., multi-million dollar) and small instructional development projects. The validation studies and Courseware's extensive field testing have shown that these procedures as a whole are very useful, but they have also shown that much work remains to be done. (For a description of the nature of the work we feel remains to be done, see below.)
6. CONCEPTS RELATED TO STRUCTURAL ADEQUACY. We have recently come to believe that principles of structural adequacy (i.e., principles which relate to teaching a number of related concepts, etc.) usually have a stronger impact on instructional outcomes than do principles of presentation adequacy. As a result of our previous and current work in the structural area, we believe that the effectiveness of a structural strategy component (e.g., a particular aspect of sequencing or of summarizing important content) depends primarily on the type of "subject matter structure." We have identified two levels of subject matter structures: orientation structures, of which there are three types, and supporting structures, of which there are five types. The type of structure provides the basis for prescribing optimal structural strategy components, similar to the way that the task-content combination provides a basis for prescribing optimal presentation strategy components.\textsuperscript{40}

Since these ideas have only recently been developed, we have few references to detailed explanations, and the state of our knowledge is very much still in transition. Therefore, our description will be anything but definitive. In this section, we shall briefly describe the types of structures that are the basis for prescribing structural strategies, and we will describe the major kinds of structural strategies.

There is only one orientation structure for a course, but it may be any of the three types: a procedural structure, a conceptual structure, or a theoretical structure. These three kinds of structures, plus learning structures and list structures, can also serve as supporting structures, each of which is nested within a part of the orientation structure. (The nature and use of orientation and supporting structures are described below.)

The procedural structure shows the relations among steps in a procedure. A procedural structure could entail such things as a method of statistical analysis, a method for troubleshooting a defective television set, a procedure for solving quadratic equations, or a procedure for designing instruction. A procedural structure may specify the set of orders in which different steps can be performed, or it may show the conditions necessary for deciding which procedure, sub-procedure, or step to use in a given situation.

The conceptual structure shows the superordinate, coordinate, and subordinate relations among related constructs in a subject matter. There are three types of conceptual structures. In a "kinds taxonomy" a subordinate concept is a kind of the concept to which it is subordinate, such as a bear being a kind of mammal. In a "parts taxonomy" a subordinate concept is a part of the concept to which it is subordinate, such as a circulatory system being a part of a mammal. Two or more taxonomic structures can be combined to form a "matrix structure," and many subject matters can be usefully described with a kinds by parts matrix.

The theoretical structure (or model) shows the interactions or cause and effect relations among concepts. These interacting cause and effect
relations are referred to individually as principles, and they basically explain why something happens as it does. A diagram which shows the cause and effect interactions among the supply, the demand, and the price of a good is a theoretical structure.

The learning structure shows "learning prerequisite" relations by describing what must be known before a given concept or principle can be learned. This is the widely misunderstood Gagné learning hierarchy, which is often confused with other kinds of structures, especially the procedural structure and the parts taxonomic structure.

The list structure shows a linear (order) relation among its concepts. The nature of the linear relation may vary—for instance, countries may be listed in order of population, area, agricultural production, birth rate, or an almost infinite number of other characteristics.

These five kinds of structures are described in detail and illustrated elsewhere. Each of these types of structures calls for the use of some different structural strategies, which are described next. We have identified four major types of structural strategies: (1) selection strategies, for deciding what content to teach, given the orientation goals and curriculum level of the course, (2) sequencing strategies, for deciding on the order in which to present the selected concepts, principles, etc., (3) synthesizing strategies, for deciding how and when to show the important relations among those concepts, principles, etc., and (4) summarizing strategies, for deciding how and when to preview and review those concepts, principles, etc., and the relations among them. It is beyond the scope of this overview to provide a detailed description of all the different strategy components that we have developed to date. But as an indication, Figure 10.3 lists the major synthesizing strategy variables that we have identified thus far.

The strategy components and the types of orientation and supporting structures are the major components of the principles of structural adequacy, which are discussed next.

7. PRINCIPLES OF STRUCTURAL ADEQUACY. At the present time, the development of principles of structural adequacy is still in its initial stages. Nevertheless, we are confident that there are important principles in all four areas: selection, sequencing, synthesizing, and summarizing. The following are some preliminary and very tentative propositions. Although they are too general to be very useful, they do provide an indication of the kinds of relationships that we feel are likely to be important for improving the methods of structuring instruction.

i. Initial Synthesis Principle. A general synthesizer—which shows the major parts of the orientation structure and the major relationships among those parts—should be presented at the very beginning of the instruction. ('Should' means that doing so will result in the instruction being more effective, efficient, and appealing.)
ii. Gradual Elaboration Principle. A synthesizer (i.e., a subject matter structure) should be provided after each elaboration (i.e., after each part of the initial synthesizer has been elaborated), in order to teach the relations among the more detailed constructs that were just taught and to show the context of the elaboration within the epitome. The detail or complexity of the relations taught should correspond to the detail or complexity of the concepts, principles, etc. that are taught in each elaboration.
iii. Type of Synthesizer Principle. The following types of synthesizers should be used under the indicated conditions: a conceptual structure for conceptual goals, a theoretical structure for theoretical goals, and a procedural structure for procedural goals.

iv. Periodic Summary Principle. A summarizer (e.g., a concise generality for each concept) should be provided after each elaboration but before the synthesizer for each respective elaboration. This will facilitate synthesis and retention.

8. A MODEL FOR STRUCTURING INSTRUCTION. The authors have constructed a tentative model of the way that we presently expect that instruction should be organized with respect to structural strategies. We refer to it as the "elaboration model of instruction." Although some aspects of the model vary depending upon conditions, there are also some basic, unvarying aspects of the model, and they are briefly described below by use of an analogy.

Taking a look at a subject matter "through" the elaboration model is similar in many respects to looking at a picture through a zoom lens. A person usually starts with a wide angle view, which shows the major parts of the picture and the major relationships among those parts (e.g., the composition or balance of the picture).

The person then zooms in on a part of the picture. One could be forced to zoom in on a certain part, or one could be given the option of zooming in on whatever part interests that person the most. Assume that instead of being continuous, the zoom operates in steps, or discrete levels. Zooming in one level on a given part of the picture allows the person to see more detail on the major subparts of that part and to see the major relationships among those subparts. At this point several options are available. The person could pan across at the same level of detail to another part of the picture. Or one could continue to zoom in another level for more detail or complexity on one of the subparts. Or one could zoom back out to the wide angle view to review the context of that part within the whole picture. Again, the person could be forced to follow a certain pattern, could be given the option of following any of a limited number of types of patterns, or could be given total freedom to follow any pattern that she or he chooses, as long as no subpart is inspected before it has been seen from the next higher level.

After viewing a set of details on a part of the picture (i.e., subparts directly below a given part), the person should zoom back out to revisit the whole part in order to synthesize that detail -- that is, to see with greater detail and understanding, the relationships among those subparts.

It must be remembered that the zoom lens analogy is just an analogy and therefore that it has non-analogous aspects. One such dissimilarity
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is that all the detail of the picture is actually present in the wide-angle view, whereas the detail is not there at all in the epitome. Also, detail is added in discrete steps in the elaboration model. Nevertheless, the similarities are many, and the analogy is insightful.

The elaboration model of instruction starts the student with a very broad, general view of the subject matter to be taught. Then it divides that subject matter into parts, elaborates on each of those parts, divides those parts into subparts, elaborates on each of those subparts, and so on until the knowledge has reached the desired level of detail and complexity.

This general to detailed organization allows the learner to learn at a level of detail that is most meaningful to him or her at any given state in the development of his or her knowledge. The learner is always aware of the context and importance of the different topics being learned. This meaningful context improves student long-term retention and student motivation. Also, the learner never has to struggle through a series of learning prerequisites that are on too deep a level of instruction. As the learner works down to deeper levels of detail, increasingly complex prerequisites will need to be introduced. But if they are only introduced at the level of detail at which they are necessary, then the learner will want to learn those prerequisites because he or she will understand their importance for learning at the level of detail that now interests him or her.

This elaboration model of instruction is described in greater detail elsewhere.

9. APPLICATION PROCEDURES FOR STRUCTURAL ADEQUACY. Finally, the following is a tentative six-step procedure for implementing the elaboration model in the design of instructional materials (See Figure 10.4).

Step 1. Choose the Type of Orientation Structure. On the basis of the general goals of the instruction, select one of the three types of orientations: conceptual, procedural, or theoretical.

Step 2: Make the Orientation Structure. This content task analysis step requires the development of the most detailed or complex version of the orientation structure selected. Detailed procedures have been developed for doing this, and they are very briefly summarized in Figure 10.4.

Step 3: Analyze the Orientation Structure. This step entails analyzing the orientation structure just created in order to identify which parts of it should be taught in the "epitome" and which should be taught in each level of elaboration. The epitome is a kind of overview that epitomizes the orientation structure--it is an extract of the essence of the
The six-step design procedure for structuring the instruction in any course entails the cognitive subject matter.
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orientation structure. Again, detailed procedures have been developed for doing this, and they are briefly summarized in Figure 10.4.

Step 4: Identify and Make the Supporting Structures. This content task analysis step requires identifying and making all the important supporting structures for the parts of the orientation structure in the epitome and in each level of elaboration. This step is basically the same regardless of the kind or orientation structure selected, and it is also briefly summarized in Figure 10.4.

Step 5: Identify the Individual Elaborations. This step entails allocating the subject matter content in each level of elaboration to the individual elaborations that comprise each level. The supporting structures and the parts of the orientation structure are allocated on the basis of the part of the epitome on which each elaborates.

Step 6: Design the Epitome and all Elaborations. The last step of the instructional design procedure is to make a "blueprint" of what the instruction (e.g., course, textbook, etc.) should look like. As for the other five steps, detailed procedures have been developed for doing this step, and they are briefly summarized in Figure 10.4.

This is a very tentative procedure which, along with the elaboration model, requires much testing and improvement. Nevertheless, we are fairly confident that type of structure should be the basis for specifying structural strategies. We envision the development of complete, integrated models for selecting, sequencing, synthesizing, and summarizing related topics of a subject matter, such that a different set of procedures would be used for each type of orientation structure and for each type of supporting structure.

REMAINING NEEDS FOR THE KNOWLEDGE BASE

The work that we have done to date and are currently doing is a step toward the goal of being able to improve the methods of instruction. But much remains to be done.

1. DEFINITION OF CONCEPTS. In the area of presentation adequacy, it appears that many of the important variables have been precisely defined and clearly labeled. However, in the area of structural adequacy, much work remains to be done, especially with respect to the identification of elemental strategy components.

2 AND 3. DERIVATION AND VALIDATION OF PRINCIPLES. It also appears that many of the important principles have been identified in the area of
presentation adequacy, but again much work remains to be done in the area of structural adequacy. Far more controlled experiments have been conducted in the area of presentation adequacy than in the area of structural adequacy, but the empirical support in both areas has not been consistent. This points to the need for investigating the relative contribution to learning (both qualitatively and quantitatively) of each strategy component when in combination (interaction) with all the strategy components which contribute more than the one component does.

4 AND 5. DEVELOPMENT AND TESTING OF MODELS OR THEORIES. Very little of what is needed has been done with respect to developing models of optimal combinations of strategy components, and even less has been done to test such models. The authors have described a research methodology which appears to be effective (a) for investigating the relative contribution (both qualitatively and quantitatively) of each strategy component when in combination with all the strategy components which contribute more than it does and (b) for investigating the ways in which individual differences and subject matter characteristics interact with those combinations of strategy components. Because of its greater external validity, this kind of research is much more important for improving our methods of instruction, and it deserves much greater effort and expenditure of resources in the immediate future.

6 AND 7. DEVELOPMENT AND TESTING OF APPLICATION PROCEDURES. This is almost completely virgin territory. Some instructional design procedures have been developed, but they tend to have a very weak and piecemeal foundation in the scientific knowledge base of instruction. The same is true for evaluation procedures (both for diagnosis of weaknesses and for rating of effectiveness), for revision procedures, and for learning procedures (i.e., procedures for students to follow in order to increase the effectiveness and efficiency of their learning methods with poorly organized instructional materials). However, extensive work in this area will have to wait for more progress in the development of a scientific knowledge base for instruction.

Once such procedures have been developed, it will be important to evaluate the cost effectiveness of each part of each procedure (a part being those steps for the application of a single principle). This cost effectiveness must be evaluated both in terms of student time vs. contribution to performance, and in terms of professional time (e.g., the rater's time) vs. contribution to professional outcome (e.g., the accuracy of the rating). We anticipate that cost effectiveness data will warrant the deletion of significant amounts of each set of procedures (diagnosis procedures, rating procedures, etc.), and it will also provide a sound basis on which to create "short form" procedures for the best possible "quick and dirty" approach.

CONCLUSION

In conclusion, considerable progress has been made in the area of
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presentation adequacy, and we are excited about recent progress on structural adequacy. But much work remains to be done in both areas, and the areas of delivery strategies and management strategies are even more wide open. It is our hope that this chapter will help draw attention to the importance of developing the knowledge base that is necessary for improving the methods of instruction. And we hope it will draw attention to the need for much greater effort and expenditure of resources in this important endeavor.

SUMMARY

First we discussed the context of instructional science and instructional technology within the discipline of educology. Instructional science and technology lie exclusively within the area of empirical studies about instruction.

Second, we described the nature of instructional science and instructional technology. The purpose of both is to develop methods of instruction that are more effective, efficient, and appealing. The importance of studying clearly characterized strategy components was discussed. And we described the concern of instructional science as being with the discovery of principles and theories of instruction, while the concerns of instructional technology is with the development of procedures for applying scientific knowledge to the solution of practical problems in instruction, such as diagnosing weaknesses in existing instruction and designing highly effective new instruction.*

Third, we proposed that seven activities are necessary if we are to develop adequately the scientific and technological knowledge base for improving methods of instruction. The seven activities are: (1) the precise definition and unambiguous naming of instructional concepts and variables, (2) the derivation of hypothesized principles, (3) the experimental testing of those principles, (4) the development of models (or theories) which prescribe "optimal" combinations of strategy components, (5) the experimental testing of those models, (6) the development of application procedures, and (7) the testing of those application procedures.

Fourth, we summarized our related work to date on those seven activities. (1) Some basic concepts were described, including a variety of kinds of methods (organizational, delivery, management) and strategies (presentation and structural). Some specific strategy components were described (generalities, instances, generality practice, and instance practice for presentation strategies; and synthesizers, summarizers,

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*In this summary, Reigeluth and Merrill make it clear that they are using 'science' and 'technology' close to the way that Steiner uses 'praxiology' and 'praxis' and Monshouwer uses 'technology' and 'technics'.

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epitomes, and elaborations for structural strategies), and the conditions which are used as a basis for prescribing strategies were also described (content types -- facts, subsets, concepts, procedures, and principles -- and task levels -- remember examples, remember generalities, and use generalities -- for prescribing presentation strategies; and types of structures -- procedural, conceptual, theoretical, learning, and list -- for prescribing structural strategies). (2) Some prescriptive principles were described, both for presentation adequacy (presentation consistency; primary presentation form selection, sequence, contents, and isolation; quantity of instances and instance practice; and instance sampling and matching) and for structural adequacy (initial synthesis, gradual elaboration, type of synthesizer, and periodic summary). (3) Some research testing the principles of presentation adequacy was briefly mentioned. (4) A model for structural strategies was summarized (the elaboration model of instruction), and the zoom lens analogy was presented; (5) No research has been done on this model to date. (6) Some procedures for applying the above-mentioned models and principles were described, both for presentation strategies and for structural strategies. And (7) some research and field testing of the procedures in the area of presentation strategies were briefly mentioned.

Fifth and finally, we described what we believe are some of the most important remaining needs for the further development of the scientific and technological knowledge base for improving the methods of instruction. These remaining needs are far greater than the progress that has been made to date, and there is a strong need to attract bright young people and more consistent funding to help push back the frontiers of this tremendously important field of educology.
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FOOTNOTES


2. Ibid.


11. Ibid.

12. 'Optimal' should be considered in terms of the effectiveness, efficiency, and appeal of the instruction. Efficiency refers to effectiveness in relation to the cost, in terms of both student learning times and the monetary cost of the instruction.


25. For an earlier version of principles of presentation adequacy, see M. David Merrill, James B. Olsen, and Nancy A. Coldewey, *Research Support for the Instructional Strategy Diagnostic Profile*, Technical Report Series, No. 3, Provo, Utah: Courseware, Inc., 1976. Also, the contents of many of the following principles were initially developed by other theorists.


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42. C.M. Reigeluth, M.D. Merrill, B.G. Wilson, and R.T. Spiller, Op. Cit. (Note 40.)

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PERSPECTIVES ON EDUCATION AS EDUCOLOGY
CHAPTER 11

TEACHING FROM ALTERNATIVE FRAMES OF REFERENCE

Diana Buell Hiatt

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TRANSITION: In the second half of the 1960's, university students throughout Western Europe and North America intensified their efforts to engage in effective political and social action. One of the centers for this activism was the University of California at Berkeley. Rachel Elder, a lecturer with the teacher education program at Berkeley during those years, found that in working with university students, she needed some means of distinguishing between the educational process, itself, and conception about that process. In drawing that distinction, she coined the term 'educology' and used it in the sense of 'ideologies about education'. Following that conception, she wrote a short paper for Far West Laboratory of Education Development (San Francisco, 1971) to which she gave the title "Three Educologies." The substance of that paper was an explanation of three ideologies about education and the necessary implications of those ideologies for the roles of the teacher and student and for the nature of learning and the curriculum. It was an extension of the "schools of thought" approach to the philosophy of education which still has some currency amongst professors of educational philosophy.

Professor Elder subsequently took a position at Pepperdine University in Los Angeles, and there she introduced the term and the conception of 'educology' as 'ideologies about education'. One of her colleagues, Professor Diana Buell Hiatt, worked with Professor Elder in explicating this conception of 'educology' and extending it to the graduate program in early childhood education at Pepperdine. Chapter 11 is one of the outcomes of that work.

To use 'educology' in the sense of 'ideologies about education' illustrates many of the points made by previous authors. In Chapter 1, for example, Breszinka traced the European origins of three traditions of inquiry about education. The tradition to which the ideas of Chapter 11 are most closely related is that of producing normative philosophical knowledge claims about education. Also, Breszinka, along with Steiner, Macia, and others argue for the importance of distinguishing amongst normative philosophical, scientific, and praxiological knowledge about education. Otherwise, what exists in education becomes conflated with what is desirable and what is effective in education. Chapter 11 illustrates this point in that it argues for teachers evaluating their practices in terms of sets of consistent conceptions about education.

Maintaining an argument for ideological consistency can lead to this difficulty: Problems of seeking to achieve knowledge about education are set aside in favor of the task of seeking to achieve consistency of language and action in relation to education. Ideological consistency in
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itself is not sufficient to establish knowledge about education, nor is
it sufficient for developing expertise as an effective practitioner within
the process of education. To determine whether a generalization about
an effective educational practice is true requires the observable evi-
dence of results. And to find out whether a generalization adequately
characterizes an existing state of affairs in education also requires
the observable evidence of extant behavior and relations. Neither re-
quires the conceivable evidence of consistency with ideology. Thus,
scientific knowledge and praxiological knowledge about education are
overlooked. The conception of 'educology' as 'ideologies about education'
does not permit their distinction.

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THE RATIONALE

The term 'educology' is an unfamiliar word to most teachers. Most
teacher preparation programs include educational philosophy, educational
psychology, instructional methods, and principles of curriculum as dis-
crete entities. The end result is that each teacher acquires a vast
storehouse of knowledge and skills that is seldom tied together with a
conceptual framework of the teaching-learning process. Educology is the
study of the teaching-learning process as a holistic entity.

Educology brings together the various components that affect the
teaching-learning process and describes the interaction among those var-
ious components. Figure 11.1 outlines the interaction.

![Diagram of Educology Components](image)

FIGURE 11.1
Interaction of Components that Affect the Teaching-Learning Process

Theories and empirical findings in philosophy, sociology and anthropology,
psychology and human development, and curriculum and instruction interrelate.
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Many teachers, when faced with explaining their point of view on teaching, end up saying that they do a little of this or that, or suggest that they are eclectic in their approach. Many of these teachers do not understand which practice goes with which theory and how theoretical conflicts are created if one attempts a "mix-as-you-go" procedures. Such teachers are gullible to each new educational fad that comes along. Seldom are these teachers aware of the patchwork array of teaching techniques they are collecting. Persons who have only a looseleaf notebook of educational recipes and cannot match instructional practice with theoretical underpinnings will tend to become followers, not leaders in the educational process.

Educology is a relatively new term that has yet to catch favor among most educators. Most of the persons involved in teacher education have acquired expertise in one area of the field, such as philosophy, learning, curriculum development or administration. Educational methods courses have traditionally been taught in subject matter areas, thus, slicing the field of study into even smaller bits. The content of such methods courses tends to consist of current trends in those areas, rather than examining a range of alternative practices. A few institutions have adopted a particular school of thought on teaching, such as behaviorism, and have educated teachers from that frame of reference. Such an educational policy provides students only one explanation for human behavior and limits the possible solutions that may be available. In only a few instances have teacher education programs been organized to offer students alternative modes based on a holistic notion of the teaching-learning process.

Like medicine and engineering, education is an applied field of study.* Such a field draws upon research findings and theoretical principles from several related areas, such as human development and psychology, human management and group processes, and cultural anthropology. Human behavior is highly complex. Teaching, an occupation that is involved with changing human behavior, requires that its practitioners acquire knowledge and skills in identifying behavior, mastery of the processes that change behavior, and means to assess the changes in behavior. There is need to call on more than one theoretical explanation to describe all of human behavior.

The time devoted to preparing teachers with the needed pedagogical skills for handling a classroom of thirty pupils is very little compared to other semi-proessions and professions. There is little opportunity for reflective thinking. Instead, student teachers are propelled forward by a sense of urgency to accumulate those skills and pieces of information that will equip them to be successful in the classroom. Rather than

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*From this statement, the reader can see that Hiatt is not distinguishing clearly among a field of phenomena, praxis within that field, and knowledge about that field. Compare this with Fisher's discussion in Chapter 13, "The Concept of Educolgy."
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being able to acquire a vast spectrum of alternatives, teacher candidates tend to pattern their behavior after other teachers they observe practicing in the schools. A noted educational psychologist casually remarked after a session with student teachers that his students seemed more concerned with classroom management than with the forces affecting pupil learning!

Our underlying assumption here is that the individual teacher needs to be aware of the major alternative approaches to the teaching-learning process and to develop a personal conceptual framework of education and teaching. Such a framework will provide a rational basis for daily decision making in the classroom. Teachers make hundreds of split-second decisions a day involving an active clientele who are in their custody. A well thought out conceptual framework will operate as a filing and retrieval system for huge amounts of information. It will serve as a device for sorting incoming information and accommodating it so that rational decisions can be made.

FOUR MAJOR APPROACHES

Educology can be subgrouped into four schools of thought or four major approaches to the teaching-learning process -- (1) behaviorism, (2) psychoanalysis, (3) humanism, and (4) cognitivism. Each approach constructs a unique network of the various components of the teaching-learning process. We will describe the essence of these four approaches. As in any attempt to bring together divergent thinking in convergent terms, not all educators or theories ascribed to a particular school will fit tidily into the scheme.

The description of each approach will include the school's ideas regarding the following: (1) an explanation of how learning occurs; (2) the role of the learner in the teaching-learning process; (3) the role of the teacher; (4) the effects of the environment, including facilities, materials, and other persons; (5) the source of motivational rewards of learning; and (6) the structure of time and space.

1. THE BEHAVIORIST APPROACH. The most prevalent school of thought that is observed in classrooms throughout the Western world is behaviorism. This approach has a strong scientific tradition, which may be traced back to Aristotle and updated by Locke. The outlook of the behaviorists is that an individual's behavior can be controlled by exerting specific influences on the environment of the learner. The intent of the behaviorists is to focus on specific behavior that needs to be learned or reinforced in the educational setting. A great deal of basic research has been done in this area and translated into instructional methodology and materials.

In behaviorism, learning is described as the production of a desired response to a given stimulus or set of stimuli. Teaching is the structuring of the environment so that a desired response or set of responses will be elicited from the learner. The role of the teacher is to arrange the environment -- facilities, materials, and persons -- so that the
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learner will focus on acquiring the desired behavior. Appropriate reinforcement will be administered so that the learner will continue to make the desired response. The schedule of reinforcement will affect the retention of the desired responses and the rate of learning.

Teachers can be held accountable for student learning by behaviorists since teachers control the variables in the environment related to the learning process. It is assumed that the better teacher is able to organize the environment for specified ends. If pupil achievement is low, it can be traced to a teacher not being able to control the environment sufficiently so that the learner's attention is directed towards the desired behavior.

The measure of success for behaviorists is the amount of student achievement of predetermined desirable behaviors. They place importance on preciseness of educational objectives, preferring behavioral terms; standardized tests, either norm-referenced or criterion-referenced, to measure those objectives; and accountability of performance.

Behaviorism has been applied in many situations with reports of high success of mastery of desired behavior. Programs such as "Distar," the "Keller Plan," the "Premack Principle," and Cantor's "Effective Classroom Discipline" exemplify the principles of behaviorism. B.F. Skinner is the epitome of the behaviorist movement. He has researched and published extensively, and he has developed the teaching machine, programmed learning materials, individual instruction packages, and methods for behavior modification in teaching.

2. THE PSYCHOANALYTIC APPROACH. Freud and the Neo-Freudians, such as Erik Erikson, propose an alternative explanation for human behavior. They assert that man operates from basic internal drives or forces and his behavior is determined by the manner in which he resolves internal conflicts. Psychoanalysts provide strong arguments for the need to take into account both the inner meanings and the outer behavior of learners. Erik Erikson's eight stages of man outlines the significant conflicts that must be met in one's life and how one's resolution of those conflicts influences psychosocial development and the level of one's mental health. Bailey eloquently elaborates how these stages can serve as bases for the goals of education at different stages in life.

Louise Tyler reminds teachers that the goals of education should reflect an insight into "What has happened or is happening in the hidden layers of the mind?" Emotions, as well as cognitive processes and outer behavior, are aspects of the learner which should be taken into account by the teacher. Body and mind should function as a unified whole.

Psychoanalysts suggest that alternative explanations may be given for behavior and different modes of acquiring any selected skill or knowledge may be possible. The environment is perceived from an existential point of view, in which personal experience is the foundation on which abstract knowledge is built. Each person has his own particular interpretation of a situation. The selection of an instructional plan by a
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teacher should be determined by a thorough understanding of the learner's past behavior and experiences, its inner meanings, and the learner's commitment to future outcomes of the learning. In such teaching, what may be an appropriate plan for one individual's learning may not be desirable for another.

Identification is an important concept in psychoanalytic theory. A person identified with persons he feels are significant in his life and internalizes their behavior patterns. Ben Wright developed a self-analysis procedure for student teachers. The student-teacher analyzes his behavior as a product of his own psychological structure and plans ways to control his own actions. This plan will be self-motivating so that the teacher is aware of the impact he is making on the students with whom he is working. Teachers need to be aware that the state of mental health affects their self-concept, ability to teach, and communication with others.

Ways to assess learning in this school of thought include projective techniques, personal log of activities and interpretations of those experiences, interviews and direct observation. Certain projective techniques have received widespread attention and have been used for many years, such as the Rorschach and Picture Completion tests.

Bruno Bettelheim and Robert Havighurst are proponents of the adaptation of psychoanalytic thought to education. Havighurst detailed certain developmental tasks children should master at given ages in their education. Bettelheim stresses the importance of mental health and inner perception of the world on learning. He strongly advocates the teaching of moral values.

Psychoanalytic thought has remained closer to the field of clinical psychology and psychiatry than to the classroom teacher. This may be attributed to the fact that the movement introduced the role of counselors and school psychologists into the schools to promote the positive mental health of students. Teachers may have relegated psychoanalytic thought to "specialists."

3. THE HUMANISTIC APPROACH. Abraham Maslow and others felt uncomfortable with both the previous psychological bases of human behavior and argued for a third force psychology. This approach is based on the discovery of the inner self through self-growth, rather than conflict resolution of reinforcement. Maslow's work emphasizes the self and inner direction, and thus it has been named, "humanistic."

Humanism is derived from the philosophical notions of Rousseau that man is inherently good and that it is society that imposes "evil" on the emerging man. Man is asserted to be curious, and thus he has the innate potential for learning. Learning occurs when the individual feels the need to acquire knowledge or skill that has relevance for his own purposes. Learning is perceived from a personal point of view. The individual
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learner is the source for determining what is important to learn, when and how it should be learned. The role of the teacher is to serve as a facilitator or counselor. The teacher views each person in the class as a unique individual rather than a collective group directed towards gaining certain knowledge or skill. In this approach, the teacher and the learner will mutually establish educational goals, select optional means to reach those goals, specify how other learners may become involved, and choose how the learning will be evaluated.

Rather than the school being perceived as an organization which directs learning toward preordained ends, the school is an open concept. In it, the child learns through discovery while exploring all aspects of the environment. From a limitless array of options, the learner must adjust his decision making skills so that the experience he encounters help him actualize the potential within himself. True heights of learning are called peak experiences.

Choices can be threatening when one is selecting and evaluating one's own learning. Therefore, learning requires a supportive, nurturing environment. Maslow describes various levels in the supportiveness of the environment for human growth. He begins with the basic necessity of provision for physiological needs and continues to construct a hierarchy of needs with successive levels being security and safety needs, love and belongingness, self esteem and esteem by others, and finally self actualization. He cautions teachers that most persons are not good choosers, and therefore they will not become self actualized. He suggests that learners venture into new areas, try the unknown, and create more difficult challenges to conquer. Some have misinterpreted Maslow as one who releases children from all constraints. As A. S. Neill cautioned regarding his own program at Summerhill, the self selection process is to foster "freedom, not license." The support system is maintained, assuring the child's success and well being.

Humanists use space and time, seldom as constraints, but as natural sources of limits to any activity. Examples heard may include: "We will need half of the school yard in order to play soccer; I will take three days to complete this chemistry experiment; I think I will use the darkroom for ten minutes to process these negatives." The environment of the classroom reflects flexible furniture arrangements, displays of children's work, and many opportunities for the children to plan, organize, and decorate their room.

Humanists prefer modes of evaluation that include case studies, pupil profiles, and products of the individual learner. Evaluation is based on the personal growth of each learner according to the goals the learner has intended to obtain.

There have been a number of programs designed to help students develop sensitivity to their feelings and the feelings of others, examine their values, and acquire decision making skills. Some programs that have achieved widespread interest include the Glasser Circle and behavior con-
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tracts, Carl Roger's student oriented curriculum, Rath's and Simon's value clarification techniques, and the Magic Circle for the elementary grades. Each of these programs is an educational adaptation of client centered group therapy. Krathwohl's taxonomy of educational objectives in the affective domain is a tool that teachers can use to develop goals and assess student growth in this area.

4. THE COGNITIVE APPROACH. The most recent thrust to eduology is spearheaded by a diverse group of educators, who are concerned with information processing. They are coming together and calling themselves "cognitivists." Cognition is the term used by this school of thought's most well known thinker, Jean Piaget, to describe the process of how one acquires knowledge of the world. The philosophical foundation of these theorists rests on Hume's and Kant's arguments for the perceptual basis of knowledge. Each man acquires his own knowledge through perception with his senses.

The work of cognitive psychologists is presently more involved with basic research than with educational applications. Consequently, teachers may be the least aware of this approach to the teaching-learning process. However, as cognitive theory reaches the educational setting, it will find favor with those teachers who value the tradition of scholarly inquiry or the action based school environment.

Many of the researchers in cognitivism are focusing on one particular aspect of information processing. Jean Piaget has the most comprehensive explanation of the learning process, yet one that is regarded as controversial with some American psychologists studying in the same area. Piaget describes learning as the change in an existing internal schema. The process of learning occurs as a learner assimilates new information from the environment. The existing schema serves as a screen to detect likenesses and differences in the new information as compared to the stored schema. The person may alter his existing schema to fit the incoming information, a process called accommodation; or, the person may ignore the information and not process it at all. In those instances, the existing schema acts as a gatekeeper to halt any new information to the brain. When the individual has accommodated successfully to the new information, Piaget states that the schema is in a state of equilibration. He borrowed that term from the field of biology. The term refers to the mutual relationship between elements entering a system and the existing system; a change in any one of the elements will effect change in all of the others, so that a balance or state of homeostasis is maintained.

Piaget has identified three major states through which each individual must progress in order to reach the fourth stage of adult formal reasoning. These stages are the sensorimotor period lasting from birth to language expression, preconceptual operations lasting from approximately two years of age to seven, and concrete operations lasting from age seven to abstract thinking. Research has suggested that not all persons reach the stage of formal operations and some rely on concepts of actual objects in order to reason. Piaget's work stresses the need for sensorimotor
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experiences to serve as the groundwork on which to build concrete operations before reaching the level of adult abstract or symbolic thought.

The role of the teacher is to perform as a guide in the discovery process of learning. The teacher may pose problems, ask questions, and stimulate the learner's inquiry. The evaluation of the learning process centers on the learner's increased competency in problem solving and reasoning. Students are encouraged to study failures as well as successes as means to obtain understanding. For example, in a cooking class it was noted that one child mistook 't' to mean tablespoon when measuring mustard for a sauce. From the strong taste of the sauce, the student was able to identify that too much mustard had been added and queried the teacher on the meaning of the symbol 't'.

Jerome Bruner, Constance Kamii, and Herbert Klausmeier are a selected few from a growing number of contemporary psychologists in this area. Bruner emphasizes the importance of the discovery approach to learning as a way for children to internally organize perceived relationships. He applied his ideas to the development of a social studies program, called "Man: A Course of Study." Kamii's work centers on the development of preschool children and training teachers to utilize small group discussion and decision making, self selection of action based activities, and sensorimotor exploration coupled with teacher questioning in their teaching. Herbert Klausmeier has been active in the creation of individually guided instruction which includes modules for teacher training, school organization, and a wide range of instructional materials.

Preferred methods of evaluation include anecdotal information from observations and student responses to inquiry questions in order to formulate individual student profiles of academic progress.

A SUMMARY

This survey was intended to explore frames of reference that comprise the legacy of contemporary education. Each suggests alternative approaches to the means and ends of education and differing roles for the learner and the teacher in the educational process. There does not seem to be any inherent superiority of one approach over another, only a different explanation of certain aspects of teaching and learning.

One of the approaches may be more appealing to you than another. As you analyze your own teaching, you may determine which approach you tend to prefer. Comprehension and mastery of the four schools of thought will increase the number of alternative solutions that may be possible in any given teaching situation. Knowledge of all four should foster a wider understanding of other teachers' positions and a deeper appreciation for the legitimacy of their point of view. There is a strong disagreement within as well as among advocates of each approach to education.

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Each thrust contributes to the knowledge of the science of teaching. But, it is the individual teacher who, in the act of applying such scientific knowledge, demonstrates the art of teaching. It takes a highly skilled professional to create a blend that possesses internal consistency between the various theoretical conceptions and day to day practice. The ability to draw from divergent points of view and to create a contextual whole is the hallmark of the true professional. Such a person is open to new ideas, but has an internal conceptual stability. The art of the science of teaching is bringing a range of theoretical principles to the decision making process of teaching and applying those principles to meet the needs of a given situation.
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FOOTNOTES

1. The author wishes to express appreciation to Rachel Ann Elder, a former colleague at Pepperdine University, for introduction to the term 'educology'. Elder used the term in a paper written for Far West Laboratory of Educational Development (San Francisco, mimeographed, 1971): "Three Educologies." She also used it in her classes with students specializing in early childhood education. Her conception of educology is the one that is followed in this chapter.


CHAPTER 12

EDUCOLOGY AS AN ORGANIZATIONAL CONCEPT FOR SCHOOLS OF TEACHER EDUCATION, COLLEGES OF EDUCATION, AND FACULTIES OF EDUCATION

James E. Christensen and James E. Fisher

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TRANSITION: The recurrent theme in this volume is that educology is conception about education. This conception is located in language, and when this language correctly and adequately characterizes the educational process, it constitutes knowledge about that process. The authors of this volume vary in their explication of the implications of educology. However, they all agree that it is possible for us to engage in education about education; that we can study each other's ideas about education; and that it is useful, from the point of view of clarity, to name ideas, or conceptions, about education 'educology'.

The question arises as to whether the term and concept of educology have any utility other than that of clarification. In this chapter, the authors argue affirmatively. They show how the use of educology can facilitate decisions regarding the matters, for example, of (1) naming and describing courses, (2) arranging curriculum, and (3) organizing academic staff in schools, colleges, and faculties of education and teacher education (i.e., units of educology). The conception of educology that is followed in this next chapter is that educology names knowledge about education. The distinctions which Steiner made of performative, qualitative, and quantitative knowledge are acknowledged. But only the category of quantitative educology is used in the discussion of possible applications of educology to the solution of selected educational problems. Educology as quantitative knowledge, or true generalizations, in this chapter, is related to the concepts of subfunds of knowledge, subdisciplines of knowledge, kinds of knowledge, and objects of knowledge. These concepts, in turn, are related to the recurrent problems of (1) what names to give courses, (2) what arrangements to make of courses, and (3) what organization to provide for staff in educational institutions whose purpose is to teach and extend knowledge about the educational process.

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INTRODUCTION

How should courses and academic staff be organized? Particularly, how should they be organized so that the resulting structure...

1. achieves logical consistency
EDUCOLOGY AS AN ORGANIZATIONAL CONCEPT

2. retains flexibility;
3. dispels ambiguity;
4. overcomes undue pressure from traditional prejudices and interest groups;
5. permits professional individuality and development, but excludes exploitation of the institution by the individual staff member;
6. assurs the integrity of the institution without stifling the creativity and responsible freedom of the professional staff members.

Schools, faculties, and colleges of education and schools of teacher education within universities share this set of problems in common. Since courses offered by such academic units consist of studies about the teaching and studenting process, one possible solution is to derive a set of organizational principles in relation to the kinds of knowledge that are implied by the concept of studies, or knowledge, about education.

A term which means the same as 'knowledge about education' is 'educology'. It was coined to clear up the confusion caused by using the word 'education' to mean 'the teaching and studenting process' and also 'knowledge about the teaching and studenting process'. The term has gained modest currency in discourse about education, but, of course, the terms 'education' and 'education studies' are more often used.

Given its unfamiliarity, are there any advantages in using the term 'educology'? One is its power to remove ambiguity from statements. In the sentence,

In their education, to become teachers, students study education, mathematics, and history,

'education,' means 'teaching and studenting process', and 'education,' means 'knowledge about the teaching and studenting process'. Suppose that this substitution is made:

In their education to become teachers, students study educology, mathematics, and history.

The term 'educology' clarifies the meaning of such sentences, but its utility goes beyond removing ambiguity. The term and its concept can also be used to classify kinds of knowledge about education.

Sometimes 'knowledge' is used to mean a condition of mind, a skill, or the realized ability to perform adequately in some way. And sometimes it is used in the sense of a set of verified statements. When 'knowledge' is used in this second sense, the concept of educology becomes a powerful tool for classification. Educology implies at least three kinds of quantitative knowledge about education: empirical, normative and analytic. These distinctions are made with respect to the standard of verification.

Empirical knowledge (in the sense of quantitative statements) is the
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set of statements which is verified by observing actual events, or aspects of a field of phenomena, and determining whether the events, or aspects, match the statement. Empirical statements about education can be further divided into at least two categories with respect to aspects of the field of phenomena to which the statements refer. One category is about extant educational phenomena. A second is about effective educational practices. The first consists of generalizations about extant aspects, features, and relationships of the teaching and student process. The second consists of generalizations about educational praxis -- that which we should do and refrain from doing in order to get the results that we want in the teaching and student process. The first category of empirical educology can be called scientific, and the second, praxiological. ⁵

'Praxiology' means 'knowledge about effective practices, procedures, or methods for doing something'. ⁶ Praxiology includes the concept of technology, and it also implies all quantitative knowledge about how to achieve desired results which are other than a physical object (e.g. maintaining mental health, effectively arguing a legal case, or intentionally causing learning).

![Diagram of Empirical Statements](image)

**FIGURE 12.1**
Categories of Empirical Statements

Verified empirical statements are products of successful empirical inquiry. Just as empirical statements divide into at least two categories so empirical research divides into scientific and praxiological inquiry. Scientific inquiry about education implies asking questions such as:

1. How do different teaching methods affect learning?
2. What functions do grading and assessment systems perform in educational institutions?

Praxiological inquiry about education implies asking questions such as:

1. What teaching methods are effective for getting pupils of ages 9 to 10 to understand division?
2. What procedures work in eliminating misconduct in the classroom?
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Scientific knowledge about education is the science of education, or scientific educology. It is true generalizations about existing states of affairs in the field of educational phenomena. Praxiological knowledge about education is the praxiology of education, or praxiological educology. It is true generalizations about effective practice in the field of educational phenomena. Both sets of knowledge serve as part of educology. Both require the use of the same discipline to substantiate their knowledge claims, i.e., both require the set of rules, logical operations, and procedures demanded by empirical inquiry. The two bodies of knowledge differ with respect to the feature or aspect of educational phenomena about which they generalize.

The effective practices which praxiological educology describes and characterizes are not intrinsically good. For example, educologists might find that malicious and cruel treatment are effective in causing someone to learn something. Yet the effectiveness of these treatments would not be sufficient justification to use them as educational practices. This leads us to another category of statements about education: those concerning the intrinsic goodness and badness of goals, practices, policies, or behaviors in the teaching and studenting process. Such statements are normative. Examples are:

1. Teachers should not victimize their students.
2. Intellectual development should be the primary goal of secondary education.

We form an agreement with a normative statement by establishing some set of criteria to which we are willing to commit ourselves, or to live by. And we observe whether behavior, practices, or events conform to the criteria. Statements verified by this process constitute normative knowledge, and the kind of research which forms this knowledge is normative inquiry (sometimes called evaluative research). Normative knowledge about education is true generalizations about intrinsically good states of affairs in the field of educational phenomena. Other names for this normative knowledge are normative philosophy of education, and normative philosophical educology.

A third way in which we can verify statements is by determining whether they are consistent with other statements. We examine the meaning (i.e., necessary implications) of a statement in relation to a set of other statements and reason whether they are consistent. A statement that is treated in this way can be called analytic. Examples are:

1. Education implies teaching and learning.
2. The result of effective teaching is learning.

Analytic inquiry, if successful, produces true analytic statements (which is analytic knowledge).

At least three categories of knowledge about education can, therefore,
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be distinguished with respect to standards of verification (or discipline): analytic, normative, and empirical.

\[
\text{THE INQUIRY NECESSARY TO PRODUCE EDUCOLOGY IMPLIES: ANALYTIC INQUIRY, NORMATIVE INQUIRY, AND EMPIRICAL INQUIRY.}
\]

\[
\text{EDUCATION, i.e., TEACHING AND STUDENTING SOMETHING IN SOME SETTING.}
\]

\[
\text{FIGURE 12.2}
\]
Three Kinds of Inquiry (and Discipline) Implied by Educology

'Discipline' in this context is taken to mean the set of rules, logical operations, and procedures required for making warranted assertions, or knowledge claims. Analytic inquiry requires the use of one set; normative a second set; and empirical, a third. All three kinds of inquiry about educational phenomena are possible, thus the set of disciplines necessary for the research task of making educology (i.e., making true generalizations about educology) includes at least these three. The discipline of educology implies at least analytic, normative, and empirical discipline.

Another possible name for analytic knowledge about education is 'analytic educology', and analytic educology implies at least three categories: analytic philosophy of education, history of education, and jurisprudence of education. All three are subfunds of knowledge about the implications of language about education. The first is knowledge about the necessary implications of any concept or statement in educational language; the second is knowledge about the necessary implications of language about past educational phenomena; the third, about necessary implications of legal language which guides and regulates persons in the teaching and studenting process. All three subfunds share the same discipline, i.e., the discipline of analytic inquiry. They differ with respect to the feature or aspect of educational phenomena about which they generalize.

\[
\text{SUCCESSFUL USE OF THE DISCIPLINE OF ANALYTIC INQUIRY PRODUCES THREE SUBFUNDS OF ANALYTIC EDUCOLOGY:}
\]

\[
\text{ANALYTIC PHILOSOPHY OF EDUCATION (ANALYTIC PHILOSOPHICAL EDUCOLOGY), HISTORY OF EDUCATION (HISTORICAL EDUCOLOGY), AND JURISPRUDENCE OF EDUCATION (JURISPRUDENTIAL EDUCOLOGY).}
\]

\[
\text{FIGURE 12.3}
\]
Subfunds of Analytic Educology

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Normative knowledge about education is normative educology, or normative philosophy of education. Often the term 'philosophy of education' is used without distinguishing between analytic and normative philosophy. This usage conflates different kinds of knowledge. Analytic philosophy of education requires the use of necessity reasoning, and that knowledge which is analytic philosophy of education describes and characterizes the necessary implications of concepts and sentences used in the language of education. The knowledge that is normative philosophy of education requires the use of evaluative reasoning for its verification, and it describes and characterizes aims, practices, or policies which have worth in education. The theorizing of Dewey, Bayles, and Butler, for example, counts as normative philosophy of education. The theorizing of Ryle, Scheffler, Smith, and Gribble is analytic philosophy of education.

\[
\text{ANALYTIC PHILOSOPHY OF EDUCATION } \equiv \text{KNOWLEDGE ABOUT MEANINGS OF CONCEPTS AND PROPOSITIONS IN EDUCATIONAL LANGUAGE}
\]

\[
\text{NORMATIVE PHILOSOPHY OF EDUCATION } \equiv \text{KNOWLEDGE ABOUT WORTHWHILE AIMS, POLICIES, AND BEHAVIORS IN THE EDUCATIONAL PROCESS}
\]

**FIGURE 12.4**
Two Meanings of 'Philosophy of Education'

The concept of 'language of education' functions ambiguously. It can mean (1) 'language which occurs within the process of teaching and studenting', and it can also mean (2) 'language which is about the process of teaching and studenting'. In its first sense, language of education means language \text{in} education.

\[
\text{[LANGUAGE OF EDUCATION]}_1 \equiv \text{LANGUAGE IN EDUCATION}
\]

In its second sense, language of education means language \text{about} education.

\[
\text{[LANGUAGE OF EDUCATION]}_2 \equiv \text{LANGUAGE ABOUT EDUCATION}
\]

What a person says while engaged in the role of teaching is an example of [language of education]_1, or language \text{in} education. Educology, or true generalizations about the field of educational phenomena, is an example of [language of education]_2 or language about education.

Given this distinction between two senses of 'language of education', a third meaning of 'philosophy of education is possible to discern. Language about education can be an object of inquiry. It can be analyzed, and true statements (i.e., knowledge) about it can be produced. This set of true statements constitutes a fund of knowledge. It is the logic
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and epistemology of making quantitative statements about the educational process. In common usage, this fund could be named 'philosophy of education', because in common usage, 'education' is a term that names (1) the teaching and studenting process and (2) knowledge about that process. But a name that more adequately characterizes the fund is 'analytic philosophy of educology'. The substitution of 'educology' for the term 'education' in the name 'philosophy of education' clarifies that the object of knowledge is language about education, and the substitution of 'analytic philosophy' for 'philosophy' in the name clarifies that the fund of knowledge requires the use of the discipline of analytic inquiry.

In summation, three meanings of 'philosophy of education' are:

1. Analytic philosophy of education, or knowledge about meanings of concepts and propositions in educational language;
2. Normative philosophy of education, knowledge about worthwhile aims, policies, and behaviors in the educational process;
3. Analytic philosophy of educology, or knowledge about rules, logical operations, and procedures for making warranted quantitative statements about the educational process.

The first two are subfunds of educology. The third is knowledge about educology. It is meta-educology.

'Science of education' and 'scientific educology' are names for a subfund of knowledge about education that has two distinguishing characteristics: (1) It is about extant aspects of the field of educational phenomena, and (2) the set of statements of which it consists are verifiable by some means of observation.

In one sense, scientific educology includes the psychology of education, sociology of education, anthropology of education, economics of education, political science of education, and physiology of education. In another sense, it does not. For example, the term 'sociology' names knowledge about society, and the term 'sociology of education' is made to function ambiguously. At times, it is used to mean 'knowledge about the effects of education upon society'. At other times, it is used to mean 'knowledge about the effects of society upon education'. Knowledge which treats society as the dependent variable and which characterizes the effects of other factors upon society is sociology. Knowledge which treats education as the dependent variable and which characterizes the effects of other factors upon education is educology. The first sense of the term 'sociology of education' implies a subfund of sociology. The second sense of 'sociology of education' implies a subfund of educology, and a better name for this second sense is 'educology of society'.

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\[ \text{Sociology of Education}_1 \equiv \text{Knowledge about the Effects of Education upon Society} \]
\[ \equiv \text{Knowledge about Society} \]
\[ \equiv \text{A Subfund of Sociology} \]

\[ \text{Sociology of Education}_2 \equiv \text{Knowledge about the Effects of Society upon Education} \]
\[ \equiv \text{Knowledge about Education} \]
\[ \equiv \text{A Subfund of Educology} \]

The same argument holds for terms such as 'psychology of education', 'economics of education', etc. Where they are intended to mean knowledge about the effects of something upon education, they are better named the

- Educology of mental processes,
- Educology of economic systems,
- Educology of cultural processes.

The concept of 'educology of' extends to any object of knowledge that is an aspect of the field of educational phenomena. Thus, the

- Educology of reading,
- Educology of religious education,
- Educology of educational leadership, and
- Educology of curriculum,

are all conceivable.

Some people maintain that the terms 'educational psychology' and 'sociology of education' name disciplines.\(^{11}\) It seems to make more sense to regard them as names for funds of knowledge which are not educology at all, in one sense, and as subfunds of educology, in a second sense. And in the second sense, the subfunds imply the use of all three standards for asserting knowledge claims (analytic, empirical, normative).

One red herring that keeps popping up is that educology is not a discipline in its own right.\(^{12}\) Rather, it borrows from other disciplines such as sociology, psychology, and economics. This is a red herring because sociology, psychology, and educology imply use of the same standards for judging the truth value of knowledge claims. An empirical knowledge claim remains empirical, regardless of whether the claim is about society, and thus an empirical sociological claim; about mental processes, and thus an empirical psychological claim; or about education, and thus an empirical educological claim. A distinction can be made between sociology and educology, of course, but it is in relation to the object of knowledge (i.e., the field of phenomena about which generalizations are made), not the discipline of knowledge (i.e., the rules, logical operations, and
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procedures for making knowledge claims).

Notwithstanding the implication that if 'sociology', 'anthropology', and 'economics' are terms which name all knowledge about society, mankind, economic systems, some researchers insist upon restricting the use of terms such as 'sociology', 'psychology', 'anthropology', and 'economics' so that they name only scientific knowledge. How do the implications of the concept of 'scientific educology' or 'science of education' relate to these restricted usages? In the case of 'sociology of education' naming only scientific knowledge of the effects of society upon the educational process, then sociology of education is a subfund of scientific educology. In the case of 'sociology of education' naming only scientific knowledge about the effects of the educational process upon society, then sociology of education is a subfund of sociology and not part of educology, scientific or otherwise. So, scientific educology does imply the subfunds of sociology of education, anthropology of education, economics of education, and psychology of education, where these terms are intended to mean only scientific knowledge, and where the educational process is characterized as the dependent variable.

![Diagram of Subfunds of Science of Education]

**FIGURE 12.5**
Subfunds of Science of Education

In the case where these terms do name subfunds of scientific educology, then their meanings are unchanged with the following term substitutions:

- **Psychology of Education** \equiv **Scientific Educoology of Mental Processes**
- **Sociology of Education** \equiv **Scientific Educoology of Society**
- **Anthropology of Education** \equiv **Scientific Educoology of Cultural Processes**
- **Economics of Education** \equiv **Scientific Educoology of Economic Systems**
- **Political Science of Education** \equiv **Scientific Educoology of Political Systems**
- **Physiology of Education** \equiv **Scientific Educoology of Organic Systems**

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While the six categories just identified as subfunds of scientific educology differ with respect to the aspect or feature of the field of educational phenomena about which they generalize, they all require the use of the same discipline. They require the use of the rules, logical operations, and procedures of empirical inquiry.

Thus far, two major subfunds of empirical educology have been distinguished: scientific and praxiological. A third is possible, and it can be named the 'political praxiology of education'. Effective practices for teaching and studenting differ from effective practices in the governance, management, and administration of the teaching and studenting process. In order for a teaching practice to be judged effective, it must attain understanding of what is being taught prior to attaining acceptance of what is being taught. Effective administrative practices for education do not necessarily have to meet the condition of understanding prior to the condition of acceptance. An administrative practice is politically sound, even if understanding of the policy, rule, regulation is not achieved, but acceptance is achieved. For example, if a state department of education wishes to introduce a new music curriculum into the school systems, gaining acceptance from the teachers and students for the new curriculum, without achieving their understanding of the justification for the new curriculum would still count as effective administration, from a political point of view. Knowledge about how to get teachers, students, and others to accept innovations in education and to accept existing regulations and policies constitutes the praxiology of political practices for education. 'Praxiology of political practices for education' means the same as 'praxiology of the politics of ('of' in the sense of 'for') education' and it also means the same as the 'political praxiology of education'. These terms name the knowledge (i.e., the true generalizations about) what to do in order to gain acceptance of policies to regulate teaching and studenting. It is a third subfund of empirical educology. It is not a separate discipline from science of education and praxiology of education because the knowledge of which it consists requires the use of the rules, logical operations, and procedures of empirical inquiry. It differs from the other two with respect to the feature of the field of educational phenomena that it characterizes.

**Figure 12.6**

Subfunds of Empirical Knowledge about Education

The concept of educology, in the sense of true quantitative statements
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about the teaching and studenting process, thus implies three kinds of knowledge (analytic, normative, empirical) and the use of three sets of rules, logical operations, and procedures (those for analytic, normative, and empirical inquiry). The discipline of educology is the three sets, and each of the sets can be regarded as a subdiscipline of the discipline of educology. Each subdiscipline can be used to produce subsets of funds of knowledge that are part of the fund that is educology. The subdiscipline of analytic inquiry can be used to produce the subfunds of historical, analytic philosophical, and jurisprudential educology, and it can be used to produce the analytic philosophy of educology, as well. The subdiscipline of normative inquiry can be used to produce the subfund of normative philosophical educology. And the subdiscipline of empirical inquiry can be used to produce the subfunds of scientific, praxiological, and political praxiological educology: 13

Subfunds of meta-educology
1. Analytic philosophy of educology
   (Analytic philosophical meta-educology)

Subfunds of educology
1. Analytic educology
   1.1. Analytic philosophical educology
       (Analytic philosophy of education)
   1.2. Historical educology
       (History of education)
   1.3. Jurisprudential educology
       (Jurisprudence of education)
2. Normative educology
   2.1. Normative philosophical educology
       (Normative philosophy of education)
3. Empirical educology
   3.1. Praxiological educology
       (Praxiology of education)
   3.2. Political praxiological educology
       (Political praxiology of education)
   3.3. Scientific educology
       (Science of education)
       3.3.1. Scientific educology of society
           (Sociology of education)
       3.3.2. Scientific educology of cultures
           (Anthropology of education)
       3.3.3. Scientific educology of mental
           processes (Psychology of education)
       3.3.4. Scientific educology of economic
           systems (Economics of education)
       3.3.5. Scientific educology of politics
           (Political science of education)

The differences that distinguish subfunds of knowledge about education can be clarified by examples. Suppose that we wish to conduct inquiry and establish knowledge about mathematics curricula. Curriculum is an
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aspect or feature of the field of educational phenomena, and different kinds of questions can be posed about this aspect:

1. The question, "What mathematics curricula are currently being used in schools," implies the use of the discipline of empirical inquiry to answer it. And the set of true generalizations which constitute an adequate answer implies the subfund of scientific educology. It is an empirical question, and its answer is located in, or is part of, the science of education (or scientific educology).

2. The question, "What mathematics curricula are effective in promoting learning," implies the use of the discipline of empirical inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the subfund of knowledge named praxiological educology. It is an empirical question, and its answer is located in the praxiology of education.

3. The question, "What should we do in order to get teachers, students, and parents to accept a new mathematics curriculum in the school program," implies the use of the discipline of empirical inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the subfund of knowledge named political praxiological educology. It is an empirical question, and its answer is located in the political praxiology of education.

4. The question, "What mathematics curricula have been used in schools in the past," implies the use of the discipline of analytic inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the subfund of knowledge named historical educology. It is an analytic question, and its answer is located in the history of education.

5. The question, "What mathematics curricula are permissible in law," implies the use of the discipline of analytic inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the subfund of knowledge named jurisprudential educology. It is an analytic question, and its answer is located in the jurisprudence of education.

6. The question, "What is meant by the concept of mathematics curriculum," implies the use of the discipline of analytic inquiry to answer it. The set of true generalizations which constitutes an adequate answer
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implies the subfund of knowledge named analytic philosophical educology. It is an analytic question, and its answer is located in the analytic philosophy of education.

7. The question, "What outcomes should we want from a mathematics curriculum," implies the use of the discipline of normative inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the subfund of knowledge named normative philosophical educology. It is a normative question, and its answer is located in the normative philosophy of education.

8. The question, "How can we know that generalizations about mathematics curricula are true," implies the use of analytic inquiry to answer it. The set of true generalizations which constitutes an adequate answer implies the fund of knowledge named analytic philosophical meta educology. It is an analytic question, and its answer is located outside of educology. Its answer is located in the analytic philosophy of educology.

Conventional discourse about education divides education into categories such as early childhood education, primary education, secondary education, special education, art education, and the like. These categories name aspects or features of the field of educational phenomena about which disciplined inquiry can be conducted and about which knowledge can be formed.

<table>
<thead>
<tr>
<th>DISCIPLINE USED TO CONDUCT INQUIRY ABOUT TEACHING AND STUDENTING</th>
<th>FUND OF KNOWLEDGE ABOUT EDUCATION</th>
<th>ASPECTS OR FEATURES IN THE FIELD OF EDUCATIONAL PHENOMENA (OBJECTS OF KNOWLEDGE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANALYTIC DISCIPLINE</td>
<td>EDUCOLOGY</td>
<td>EARLY CHILDHOOD EDUCATION</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PRIMARY EDUCATION</td>
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<td></td>
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<td>ADULT EDUCATION</td>
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<tr>
<td>EMPIRICAL DISCIPLINE</td>
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<td>SECONDARY EDUCATION</td>
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<td>HIGHER EDUCATION</td>
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<tr>
<td>NORMATIVE DISCIPLINE</td>
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<td>SPECIAL EDUCATION</td>
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<td></td>
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<td>CURRICULUM</td>
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<td></td>
<td></td>
<td>INSTRUCTION</td>
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<tr>
<td></td>
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<td>SOCIAL SCIENCE EDUCATION</td>
</tr>
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<td></td>
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<td>ETC.</td>
</tr>
</tbody>
</table>

**FIGURE 12.7**

Educology as a Fund of Knowledge, its Subdisciplines, and its Objects of Knowledge
EDUCOLOGY AS AN ORGANIZATIONAL CONCEPT

The same subdisciplines of educology can be used to conduct research and establish knowledge about any subset of phenomena within the field of educational phenomena. For example, the term 'primary education' in one sense means 'the teaching and studenting process of children of a certain age range'. In a second sense, it means 'knowledge about primary education'. This second meaning is intended when a student says that his or her major studies for the bachelor's degree is primary education. It is equivalent in meaning to the 'educology of primary education', and it implies the subfunds of:

- historical educology of primary education
- jurisprudential educology of primary education
- analytic philosophical educology of primary education
- normative philosophical educology of primary education
- scientific educology of primary education
- praxiological educology of primary education
- political praxiological educology of primary education

Moreover, it implies the use of the subdisciplines of analytic, normative, and empirical inquiry.

This same relationship exists between educology and any other aspect or feature of the field of educational phenomena, such as secondary education or art education. (See Figure 12.8.)

A conventional category for discussing education has been the foundations of education. This term usually has been used to mean the history, philosophy, and sociology of education and comparative education. Sometimes it has been intended to include the psychology and anthropology of education. The ambiguity of terms such as 'sociology of education' has already been discussed. Where it is used to mean a subfund of sociology, the term 'sociology of education' is denoting a fund of knowledge that is outside of educology. Where the term is used to mean 'scientific knowledge about the effects of society upon the process of education', it is naming a subfund of scientific educology. Thus, where 'foundations of education' is being used to name funds of knowledge about the effects of education upon other aspects, features, or processes, the foundations of education is outside of educology. Where the term is being used to name knowledge about the effects of society, culture, mental processes, and the like upon the educational process, the foundations of education is a set of subfunds of educology. (See Figure 12.9.)

The foundations concept thus denotes an historical grouping of subfunds of educology, and it conflates three kinds of knowledge about education: analytic, empirical, and normative. The concept also conflates subfunds of knowledge with one of the logical operations that can be used to form knowledge about education, viz., comparison. The foundations of education has historically included comparative education. That term, 'comparative education', has at least two common usage meanings: (1) the teaching and studenting process as it functions in different cultural and national settings; and (2) knowledge about two or more entities in
Figure 12.6

Education as a fund of knowledge, its subdisciplines, its subfields, and

Phenomenal

(education is produced
about which knowledge
educational phenomena
aspects in the field of

Educational

Knowledge about
subdisciplines of education
related subfields

The fund of

Analytic

Normative

Empirical

Scientific
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THE FUND OF KNOWLEDGE ABOUT EDUCATIONAL PHENOMENA

RELATED SUBDISCIPLINES USED TO PRODUCE EDUCOLOGY

RELATED SUBFUNDS OF EDUCOLOGY

JURISPRUDENTIAL EDUCOLOGY

HISTORICAL FOUNDATIONS EDUCOLOGY

ANalytic PHILOSOPHICAL EDUCOLOGY

NORMATIVE PHILOSOPHICAL EDUCOLOGY

SCIENTIFIC EDUCOLOGY

OF SOCIETY

OF MENTAL PROCESSES

OF CULTURE

PRAXIOLOGICAL EDUCOLOGY

POLITICAL PRAXIOLOGICAL EDUCOLOGY

FIGURE 12.9
The Foundations of Education as a Set of Subfunds of Educology

the teaching and studenting process which makes comparisons of these entities. That is, the knowledge characterizes these entities with respect to their similarities and differences. The first sense of comparative education relates closely to the concept of international education. It denotes an aspect or feature of the field of educational phenomena about which knowledge can be produced.

THE FUND OF KNOWLEDGE ABOUT EDUCATION

EDUCOLOGY

ASPECTS OR FEATURES OF THE FIELD OF EDUCATIONAL PHENOMENA

COMPARATIVE EDUCATION AS INTERNATIONAL EDUCATION (TEACHING AND STUDENTING IN DIFFERENT CULTURAL AND NATIONAL SETTINGS)

FIGURE 12.10
Educology and Comparative Education as an Aspect of the Field of Educational Phenomena

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The second sense of comparative education is encompassed by the concept of the discipline of educology. The rules, logical operations, and procedures that are required to substantiate knowledge claims about the field of educational phenomena constitute the discipline of educology, and comparison is one of the requisite logical operations. Generalization requires that comparisons be made, and educology implies generalizations about educational phenomena. Thus, the second sense of comparative education is implied by the meaning of the concept of the discipline of educology.

<table>
<thead>
<tr>
<th>THE DISCIPLINE OF EDUCOLOGY</th>
<th>COMPARATIVE EDUCATION AS A LOGICAL OPERATION OF MAKING COMPARISONS OF ENTITIES IN EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(RULES, LOGICAL OPERATIONS, PROCEDURES)</td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 12.11
Educology and Comparative Education as a Logical Operation

ORGANIZATIONAL USES OF THE CONCEPT OF EDUCOLOGY

A school of teacher education within a university does not usually offer all of the coursework which a student would undertake to qualify as a professional teacher. The student usually studies chemistry, botany, mathematics, history, and the like outside of the school. Within the school, he usually studies knowledge about some aspect of the teaching and studenting process. The term 'school of teacher education' functions to identify a school of inquiry and knowledge about teaching and studenting. The term means the same as a school of educology. The argument applies to a college of education, a school of education, or a faculty of educuation within a university. They are organizational units of educology.

A unit of educology (i.e., a college of education, a faculty of education, a school of teacher education, a school of education) provides learning experiences intended to result in understanding of the process of teaching and studenting. It provides education about education. Other units (schools, colleges, departments) within a university provide instruction intended to result in understanding of processes other than the teaching and studenting process, e.g., the processes of osmosis, photosynthesis, demand and supply, or socialization.

The term 'educology' is a suitable name for units (departments, colleges, schools, faculties) whose purpose is to teach and extend knowledge about the field of educational phenomena; and the concept of educology is useful in the quest for solutions to organizational problems in units of educology. Three possible uses, for example, are:

1. Naming and describing courses in an educology curriculum;
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2. Arranging together families of courses in an educology curriculum;

3. Guiding academic staff in their duties.

1. NAMING AND DESCRIBING COURSES. Coherent principles for naming and describing courses in the curriculum of a unit of educology can be derived from the structure of the discipline of educology. Three guidelines suggested by the concept of educology are:

i. Give the name of educology to all courses in the curriculum which imply knowledge about some aspect or feature of the teaching and student process;

ii. Name the set of subfunds of knowledge about education which are taught in the course;

iii. Name the phenomena which are inquired and studied about in the course.

A possible general form for writing course titles consistent with the guidelines is:

*Educoology: [Name the subfunds of educology implied by the course]: [Name the objects of knowledge implied by the course, i.e., the aspect or feature of the field of educational phenomena which is described and characterized in the course].*

A possible general form for writing course descriptions consistent with the guidelines is:

A study of [name the objects of knowledge described and characterized in the course] from the perspective of [name the subfunds of educology implied by the course].

An example will help to illustrate how these guidelines and forms can be applied. Consider the following titles and descriptions:

**TITLE AND DESCRIPTION FROM AN EXISTING HANDBOOK OF COURSES**

*Education: Educational Psychology. This subject is applied psychology and teaches the student the psychology of the child in school and its overriding importance in education. Topics covered include: motivation and its importance in the classroom;*

**TITLE AND DESCRIPTION REWRITTEN IN ACCORDANCE WITH THE GUIDELINES**

*Educoology: Normative Philosophical, Scientific, and Praxiological Educoology: Teaching and Studenting of Children. A study of the mental characteristics of children in schools, motivation in the classroom, child development and socialization, groups*
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child development and socialization — current theories; groups in school and class; psychology and the curriculum; perceptual skills; classroom dynamics and control; measurement and evaluation of learning; problem behavior in class; and the psychology of being a teacher.

in school and classrooms, perceptual skills related to the curriculum, classroom dynamics and control, measurement and evaluation of learning, problem behavior in classrooms, mental and behavioral characteristics of playing the role of teacher from the perspectives of normative philosophical, scientific, and praxiological educology.

DESCRIPTION A

DESCRIPTION B

The course description denoted by description A is as it appears in a student handbook and description B is a rewrite of the description in accordance with the three guidelines. In A, the title indicates the subfund of educational psychology, but it does not state which aspect of the field of educational phenomena is described and characterized. Also, the title malfunctions. That is, the title may be naming a fund of knowledge which is outside of educology, or it may be naming a subfund of educology. Moreover, the title may be naming analytic, empirical, and/or normative knowledge, or it may be naming a selection from the three kinds. The title, then, is ambiguous, and it does not tell enough about the content of the course.

The adequacy of description A is compromised because of category mistakes, as well. The description identifies the phenomena to be studied and characterized, but it conflates funds of knowledge with objects of knowledge. For example, in the description, applied psychology (a fund of knowledge) is listed along with socialization and groups in school and class (objects of knowledge).

The elements of the course title and description in B are derived from the implications of the language in A, and description B is more adequate in terms of clarity, explicitness, nonambiguity, and absence of category mistakes. In the title for B, the fund of knowledge about education is named: educology. The subfunds are named: normative philosophical, scientific, and praxiological educology. And the objects of knowledge are listed: children's mental characteristics, perceptual skills, problem behavior, etc. Category mistakes in the description, such as conflation of knowledge with objects of knowledge are avoided.

Correct application of the recommended guidelines requires a systematic approach to analyzing (1) the subfunds of knowledge that are implied by a course and (2) the aspects of the field of educational phenomena that are to be described and characterized in a course. A way to achieve this systematic analysis is to ask and answer the following questions:

1. Does the content of the course imply inquiry and
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knowledge which treats the educational process as the dependent variable?

2. Does the content of the course imply inquiry and knowledge about one of the following categories?
   a. Past states of affairs in education
   b. Legal states of affairs in education
   c. Meaning of the language of education
   d. Existing states of affairs in education
   e. Effective praxis in education
   f. Effective political and administrative praxis for education
   g. Good states of affairs in education

3. Does the content of the course imply inquiry and knowledge about one of the following aspects of or features of the field of educational phenomena as an object of knowledge: teacher, student, curriculum, setting, methods, styles, aids, language?

The categories listed in the third question could be extended to include the following:

```
        OFFICIAL, FORMAL
         ↓             ↓
TEACHER  UNOFFICIAL, INFORMAL
         ↓             ↓
STUDENT  OFFICIAL, FORMAL
         ↓             ↓
         UNOFFICIAL, INFORMAL
         ↓             ↓
CURRICULUM COGNITIVE
         ↓ CONATIVE
         ↓ AFFECTIVE
         ↓ GEOGRAPHIC
         ↓ SOCIETAL
         ↓ CULTURAL
         ↓
SETTING
         ↓
METHODS OF TEACHING OFFICIAL, FORMAL
         AND STUDENTING
         ↓ UNOFFICIAL, INFORMAL
         ↓
STYLES OF TEACHING OFFICIAL, FORMAL
         AND STUDENTING
         ↓ UNOFFICIAL, INFORMAL
         ↓
AIDS IN TEACHING OFFICIAL, FORMAL
         AND STUDENTING
         ↓ UNOFFICIAL, INFORMAL
         ↓
LANGUAGE OF TEACHING OFFICIAL, FORMAL
         AND STUDENTING
         ↓ UNOFFICIAL, INFORMAL
```
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The first question establishes whether any particular course is an educology course. The second identifies the subfunds of knowledge implied by the course. The third establishes which aspects or features of the field of educational phenomena the course describes and characterizes.

<table>
<thead>
<tr>
<th>CHARACTERIZATION OF THESE CATEGORIES</th>
<th>IMPLIES THESE SUBFunds OF EDUCOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past states of affairs in education</td>
<td>Historical educology</td>
</tr>
<tr>
<td>Legal states of affairs in education</td>
<td>Jurisprudential educology</td>
</tr>
<tr>
<td>Meaning of the language of education</td>
<td>Analytical philosophical educology</td>
</tr>
<tr>
<td>Existing states of affairs in education</td>
<td>Scientific educology</td>
</tr>
<tr>
<td>Effective praxis in education</td>
<td>Praxiological educology</td>
</tr>
<tr>
<td>Effective political and administrative praxis for education</td>
<td>Political praxiological educology</td>
</tr>
<tr>
<td>Good states of affairs in education</td>
<td>Normative philosophical educology</td>
</tr>
<tr>
<td>Rules, logical operations and procedures for substantiating knowledge claims about education</td>
<td>Analytic philosophical meta-educology, or analytic philosophy of educology</td>
</tr>
</tbody>
</table>

FIGURE 12.12

Relationships between Categories in the Educational Process and Subfunds of Educology (i.e., Subfunds of Knowledge about Education)

Several variations are possible in the application of the three recommended guidelines. Suppose there is an institution with a strict registrar who insists on short titles for courses. The titles could be shortened by naming only the subfunds implied by the content of a course. For example, with reference to description B just previously discussed, the title,

Educology: Normative Philosophical, Scientific, and Praxiological Educology: Teaching and Studenting of Children,

becomes

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Alternatively, the course titles can be shortened by naming only the aspects or features of the field of educational phenomena that are described and characterized in the course. For example, the title,

\[ \text{Educology: Normative philosophical, scientific, and } \]
\[ \text{Praxiological educology: Teaching and Studenting of } \]
\[ \text{Children,} \]

becomes

\[ \text{Educology: Teaching and Studenting of Children.} \]

Possible alternatives, then, are to name educology courses by

1. Subfunds of educology and aspects of education;
2. Subfunds of educology only;
3. Aspects of education only.

Whichever system is used, the mistake to avoid is the conflating of categories, i.e., naming some courses by the aspect or feature of the field of educational phenomena, and naming other courses in the same list by the subfund of educology. This would be much like describing some marbles in a set by their color and other marbles in the same set by their mass:

Marble 1: 10 grams
Marble 2: Red
Marble 3: 12 grams
Marble 4: Blue

The same order of category mistake is made when courses in an educology curriculum are named:

Course 1: School and Society [an aspect]
Course 2: Educational Psychology [a subfund]
Course 3: Art for the Young Child [an aspect]
Course 4: Sociology of Education [a subfund]

The titles of courses in this list are not comparable because they are sorting out on different categories: a subfund of knowledge about education in courses 2 and 4; an aspect of the field of educational phenomena in 1 and 3.

The use of the suggested guidelines would result in course titles and descriptions which were comparable because such category mistakes would be avoided. This would facilitate such decisions as whether to enrol in the course, delete the course from the curriculum, or modify it so that it might be more appropriate. Naming and describing courses in an educology curriculum so that courses are comparable and relationships and differences among them can be established is one practical application of the concept of educology.
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2. ARRANGING COURSES INTO FAMILIES. Often the teaching staff and administrators of an educology curriculum are called upon to arrange courses in the curriculum so that some kind of sequence, coherency, relatedness, or integration is achieved. The concept of educology can be used to help in performing the task of curricular organization. Any system of organization requires a set of critical categories, or set of distinguishing characteristics that can be used to compare, contrast, and sort out one thing from another. The set of categories which are critical in sorting out courses in an educology curriculum are the object, product, logic, techniques, and purposes of the inquiry and knowledge implied by the content of a course. By analyzing the content with respect to these five categories, adequate judgements can be made about what kind of inquiry and knowledge is implied by a course.

i. **Object.** The aspect or feature of the field of educational phenomena which is characterized, or about which generalizations are made, is an object of inquiry and knowledge. Aspects or features can be classified with respect to whether they are existent, effective, or good. They can also be classified with respect to whether they are legal or whether they were existent in the past. These categories can be used in organizing a curriculum by examining a course description, inferring what set of phenomena are implied by the description, and assigning the course to the subfund of knowledge that is implied by the object of knowledge.

ii. **Product.** The product of successful inquiry about some set of objects is sets of generalizations which describe and characterize the objects. Generalizations, if true, are sets of verified statements, and at least three kinds can be distinguished: analytic, normative, and empirical. Thus, the description of the content of a course can be analyzed with respect to whether it implies knowledge claims which require analytic, normative, or empirical inquiry for verification.

iii. **Logic.** Systematic inquiry which leads to substantiation of warranted knowledge claims requires the adherence to some set of standards of verification. At least three sets of standards can be distinguished (analytic, normative, empirical), and these sets can be regarded as the logic of an inquiry, a piece of research, or a knowledge claim. The content of a course can be analyzed with respect to the standards of verification that are implied by the knowledge claims of a course.

iv. **Techniques.** The actual behaviors performed and procedures followed in collecting evidence to support a knowledge claim can be called the techniques of an inquiry. Examples include survey, experimentation, analogy, simulation, location of documents, note taking, classification, definition, explication, model case technique, and the like. Analysis by techniques of inquiry is done by asking what techniques would have to be used to substantiate knowledge claims made in a course, and then assigning the course to the category of knowledge and inquiry that the techniques imply.

v. **Purpose.** The intended outcome of an inquiry can be called its purpose. At least five purposes can be distinguished: description,
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classification, explanation, prediction, and prescription. The descrip-
tion of the content of a course can be analyzed in terms of what pur-
poses the knowledge claims of the course serve. (See Figure 12.13.)

The use of these critical categories forms a powerful analytic tech-
nique for establishing relationships, similarities, and differences among a set of educology courses. Use of these categories can be demonstrated with a sample analysis of a course description:

*Secondary Curriculum: Agriculture I*: A general survey of agricultural education in Australia with particular reference to the role of agricultural colleges, secondary schools, universities and extension services and its contribution at secondary level to general and vocational education. Special reference will be made to recent changes in secondary agricultural curricula in Australia, particularly those relating to ecology and management. Comparisons with overseas agricultural education systems will be made to illustrate alternative approaches. A detailed study of the N.S.W. Senior School Studies Syllabus in Agriculture with special attention to those areas which may not have been specifically covered by all students in their undergraduate course in agriculture. Guidelines for teaching agriculture and approaches to teaching specific topics will also be covered.16

Analysis of this course description shows the following:

a. **Object.** The course description implies inquiry and knowledge about existing phenomena in the educational process, and specifically, existing social arrangements and functions of teaching and student knowledge about agriculture within and outside of Australian society.

b. **Product.** The course description implies empirical knowledge claims (i.e., verified empirical statements) which describe, characterize, explain, and compare.

c. **Logic.** The logic of the inquiry and knowledge implied by the description is the principle of observation.

d. **Techniques.** Knowledge claims made in the course imply the use of the techniques of survey, case studies, and participant observation for verification of the claims.

e. **Purpose.** The purposes of the inquiry and knowledge as implied by the course description are des-
Figure 12.13

<table>
<thead>
<tr>
<th>Analytic Education</th>
<th>Empirical Education</th>
<th>Epistemology</th>
<th>Philosophical Education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NORMATIVE</strong></td>
<td><strong>PRACTICE</strong></td>
<td><strong>PHENOMENA</strong></td>
<td><strong>UFS</strong></td>
</tr>
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<td>Education of the Language of Education</td>
<td>Education of the Language of Education</td>
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<td>Linguistics, Classification, Manifestation, Experimental, Explanation, Evaluation, and Analysis</td>
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<td>Analytic Inquiry</td>
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</tbody>
</table>

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description, characterization, explanation, and comparison.

Use of the five critical categories indicates that the description of the course implies empirical inquiry as the subdiscipline of the course, scientific educology as the subfund of educology, and curriculum (agriculture) and setting (schools, colleges, universities, Australian and other societies) as the particular aspects of the field of educational phenomena that are characterized in the course. It is a course in scientific educology. It characterizes the teaching and studenting of agriculture within institutional settings (e.g., schools, colleges, universities) and within selected social and cultural settings (e.g., Australia). The following is a summary of the results of a similar analysis of thirty course descriptions from the handbook of a school of teacher education. 17 (See Figure 12.14.)

This type of analysis shows the courses in an educology curriculum which share the same subdiscipline (i.e., the discipline of analytic, empirical or normative inquiry) and which are part of the same subfund of educology (e.g., historical educology, scientific educology). For example, in the analysis (See Figure 12.14), apparently unrelated courses such as,

Basic Issues in Education
Principles of Secondary Education
Traditions in Western Education
School Counseling and Guidance
Children's Literature
Foundations of Physical Education

are indeed related through a common subdiscipline (that of analytic inquiry) and membership in a common subfund of educology (historical educology). This analysis can be extended by examining the descriptions of courses in terms of the objects of knowledge that are implied. At least nine categories of aspects of or features can be distinguished:

teacher
student
curriculum for teaching and studenting
setting for teaching and studenting
methods of teaching and studenting
styles of teaching and studenting
aids for teaching and studenting
language of teaching and studenting
rules, logical operations, and procedures for substantiating knowledge claims about teaching and studenting

Using the previous list of courses that have been analyzed in terms of subfunds and subdisciplines of educology, they will now be analyzed in terms of objects of knowledge. (See Figure 12.15.)
### Course Titles in an Educology Curriculum

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Analytic Philosophy</th>
<th>Jurisprudential Philosophy</th>
<th>Political Pragmatic Philosophy</th>
<th>Pragmatic Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Curriculum: Agriculture I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary Curriculum: Agriculture II</td>
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<tr>
<td>Art for the Young Child</td>
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# EDUCOLOGY AS AN ORGANIZATIONAL CONCEPT

## FIGURE 12.15

### Analysis of an Educology Curriculum in Terms of Objects of Knowledge

<table>
<thead>
<tr>
<th>Course Titles From an Educology Curriculum</th>
<th>Teacher (characteristics, roles)</th>
<th>Student (characteristics, roles)</th>
<th>Curriculum for teaching and studentizing</th>
<th>Settings for teaching and studentizing</th>
<th>Methods of teaching and studentizing</th>
<th>Aids for teaching and studentizing</th>
<th>Language of teaching and studentizing</th>
<th>Rules, logical operations, procedures for substantiating knowledge claims about education</th>
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EDUCOLOGY AS AN ORGANIZATIONAL CONCEPT

This second analysis (Figure 12.15) shows relationships among courses with respect to whether the knowledge offered in courses describes and characterizes the same class of features in the field of educational phenomena. For example, the courses

Secondary Curriculum: Agriculture
Principles of Secondary Education
Migrant Education
Education of the Exceptional Child

are related in that the description of each implies characterization of the educational process in terms of categories of students (secondary, migrant, exceptional). (See Figure 12.15.)

In summation, the concept of educology implies a structure which can be used in the practical task of organizing educology courses into a coherent curricular system. Relating any course to the structure requires that the description of the course be analyzed in terms of the five critical categories: object, product, purpose, techniques, logic. Such analysis permits classification of the course with respect to its implied subdisciplines of educology, subfunds of educology, and categories of aspects of the educational process that are characterized. The benefits of this classification are that it reveals whether

a. The curriculum of a unit (school, college, faculty, department) of educology is weighted evenly or unevenly in relation to any one particular kind of the three kinds of inquiry about education;

b. The curriculum is weighted evenly or unevenly with respect to the seven subfunds of educology;

c. The curriculum is demanding more or less than what the staff can deliver in terms of knowledge and expertise;

d. The curriculum is consistent with the purposes that a unit of educology has undertaken to achieve.

3. GUIDING ACADEMIC STAFF. One important means of guiding staff is to organize them into units (i.e., centers, departments, divisions, colleges, schools, faculties, councils, boards) so that they can work together towards a set of common purposes. The names of organizational units function as concepts from which staff infer what their roles should be. As with the organization of courses in an educology curriculum, so it is with the organization of an educology staff: the arrangement of both requires a set of critical categories, or a set of distinguishing characteristics which can be used to compare, contrast, and sort out individuals into groups. The set of critical categories which were used
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to analyze and group educology courses can also be used to organize educology staff and name organizational units in a school, college, or faculty of educology.

3.1. Object. Suppose that the staff were organized by using only the critical category of object of knowledge. The result would be organizational units named by the set of aspects or features about which staff were to teach and research. A list of such units would be similar to the following:

The unit (department, area, division, etc.) of

art education
business education
career education
curriculum and instruction
elementary education
early childhood education
secondary education
special education
music education
etc.

Such a list can become lengthy because an enormous number of subsets of phenomena within the field of educational phenomena can be chosen for study. Therefore, a system of staff organization based upon the criterion of object of knowledge will produce a prodigious inventory of units. However, the same discipline is implied throughout (the discipline necessary to produce educology), and also the same subdisciplines (those necessary for conducting analytic, empirical, and normative inquiry). So, while groups of staff might differ in relation to particular sets of objects within the field of educational phenomena that they inquired and taught about under such an organizational system, an inter-unit similarity would exist from the implication that all staff shared a common discipline and concern for contributing to a common fund of knowledge (i.e., educology). In this organizational system, units with names such as "Foundations of Education," "Educational Psychology," "History of Education," "Sociology of Education," and "Philosophy of Education" would never appear. These terms, if used in the sense of knowledge about education, name subfunds of knowledge about education and imply particular subdisciplines. The organizational criterion of object of knowledge excludes the formation of groups of staff on the basis of subdisciplines and subfunds of educology.

3.2. Product. Suppose that staff were organized by using only the category of product of inquiry. The product of inquiry about education is knowledge claims about education, and at least three kinds of claims are possible: analytic, normative, empirical. Thus, at least three organizational units are implied:

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The unit (department, area, division, etc.) of

Analytic knowledge about education
Normative knowledge about education
Empirical knowledge about education

This list of units would have the same meaning if the following substitutions were made:

Analytic philosophical, historical, and jurisprudential educology [for analytic knowledge about education]
Normative philosophical educology [for normative knowledge about education]
Scientific, praxiological, and political praxiological educology [for empirical knowledge about education]

And the names of the units would have the same meaning if they were changed to:

Analytic philosophy of education, history of education, and jurisprudence of education
Normative philosophy of education
Science of education, praxiology of education, and political praxiology of education

Use of the criterion of product of inquiry divides organizational units along subdisciplinary lines and along lines of subfunds of knowledge about education.

3.3. Logia. Using the logic of inquiry (i.e., the principle of verification) produces the same categories for organization as the criterion of product of inquiry because a knowledge claim (i.e., a product of inquiry) is distinguishable by the set of rules and logical operations that we use to substantiate and confirm it. The three kinds of knowledge implied by educology are distinguishable with respect to the standards of verification for each of the three kinds.

3.4. Purpose. Consideration of purposes of inquiry and knowledge about education relates to arrangements of staff into units based upon subdisciplines of educology and subfunds of educology. The subdiscipline of analytic inquiry about education relates to at least three sets of purposes. (See the previous discussion on purposes of inquiry about education and Figure 12.13.) The three sets relate to three analytic subfunds of educology: analytic philosophical, historical, and jurisprudential educology. Normative inquiry about education implies one set of
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purposes, and that set implies the subfund of normative philosophical educology. The subdiscipline of empirical inquiry about education implies at least three sets of purposes, and those sets imply the subfunds of scientific, praxiological, and political praxiological educology. A possible structure for staff arranged in accordance with the criterion of purpose of inquiry would be:

The unit (department, area, division, etc.) of

analytic philosophical educology
historical educology
jurisprudential educology
normative philosophical educology
scientific educology
praxiological educology
political praxiological educology

3.5. Technique. Application of the technique of inquiry distinguishes among subdisciplines of educology. Thus the organizational units that would be related to the criterion of technique of inquiry are identical with the units distinguishable with reference to subdisciplines. Structures that are implied by techniques of inquiry are units (departments, areas, divisions, etc.) of:

analytic inquiry about education
normative inquiry about education
empirical inquiry about education

In summary, application of the concepts of object, product, logic, purpose, and technique of inquiry about education as criteria for developing a system of staff organization will result in the creation of organizational units named by either (1) objects of knowledge in education, i.e., aspects or features of the field of educational phenomena, (2) subdisciplines of educology, or (3) subfunds of educology.

In all of these organizational alternatives, units named "Educational Foundations," "Historical, Sociological, and Philosophical Foundations," and "Comparative Education" will never appear. Educational foundations as a set of subfunds of knowledge about education is implied by educology, but educology implies more than just that set. Educational foundations implies an historical arrangement of subfunds of education without reference to the object, product, logic, purpose, or technique of inquiry that are related to the subfunds. And the concept of educational foundations conflates subfunds of knowledge about education with a logical operation used in producing knowledge about education (viz., comparison). This category mistake is avoided by using the criteria for organization discussed above.

4. CHANGE AND STABILITY. It is a fact of institutional behavior
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that once people are arranged in a particular way of which they approve and value (or are simply familiar with and accustomed to), they will usually strive to maintain and expand that arrangement. This pattern of self-protection and perpetuation has been named the preservation function of an organization. Yet, for the institution to remain faithful to its primary purposes, it often must change to effectively and efficiently cope with new conditions of its social environment. Also, an educational institution must keep itself flexible and dynamic in order to develop new theory and knowledge about education. These pressures and necessities for an educational institution to adjust to new circumstances, to experiment, and to innovate have been called the change function of the institution.

The sociological theory of change and preservation functions in an educational institution can be related to educology as an organizational concept. Administrative decisions within educational institutions in general, and within units (schools, colleges, faculties, departments, areas, divisions, centers, etc.) of educology in particular, can be sorted into at least three categories: (1) personnel, (2) curricular, and (3) research decisions. Personnel decisions involve selection of criteria and nomination of persons for employment, promotion, teaching assignments, committee membership, and the like. Curricular decisions involve problems such as questions of which programs to develop, what courses to offer, when to schedule them, what courses to modify or delete. Research decisions relate to such matters as which projects to fund, what kinds of research to emphasize, and whether to coordinate research interests and efforts.

Of the three categories of decisions, it would be most important to assure that the change function operated effectively in the curricular and research decision making processes and the preservation function operated in the domain of personnel decisions. It would be in the development of educology curricula and research that innovation, experimenta- tion, and dynamic response to the social environment would be imperative to improve upon course structures and add to the body of knowledge about education. On the other hand, decisions about whether to hire, retain, promote, reassign, and dismiss teaching and academic staff require considerations of tenure, morale, humaneness, and action by professional associations. It is a process which is much less amenable to change than curricular revision and research orientation.

All of this suggests that a unit of educology, whether it be a school, college, faculty, department, or the like, should have a multiplicity of administrative structures which are based upon an integration of the stable and dynamic features of educology with the natural institutional forces for preservation and change. One possible system of organization is that of creating a set of units to coordinate curriculum development, another to orient research, and a third to supervise and develop staff. The first two would be named by the sets of aspects or features of the educational process. The third would be named by the subdisciplines of the discipline of educology. For example, within a school or college of educology,
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there could be a set of units (e.g., committees, task forces, centers) of:

- art education
- business education
- career education
- consumer education
- early childhood education
- etc.

The number of these units would vary as interest and support dictated. The functions of these units would be to make curricular decisions (such as decide upon the titles and descriptions of a set of educology courses), articulate an overall rationale which relates such courses to a program, choose whether to delete or modify existing courses. To assure that these units faithfully served the necessary function of change, innovation, and pursuit of improvement, it might be preferable to create them on an ad hoc, temporary basis. The task force concept is especially appropriate for these organizational units. This concept implies that a particular goal be established (e.g., creation of an educology curriculum for preparation of primary school teachers) and that the group (i.e., the task force) be disbanded upon completion of the task.

For coordination of research projects in a school, college, or faculty of educology, the same organizational concepts are applicable. A set of units called research units (committees, task forces, centers, etc.) could be created on an ad hoc basis. They would be named by the object of knowledge, and their purpose would be to produce new theory and knowledge about aspects or features in the field of educational phenomena. The research units, like the curriculum units, would vary as interest and support dictated.

In contrast to units organized on the basis of objects of knowledge, a third set of units could be formed on the basis of subdisciplines of educology. Their function would be to supervise, regulate, evaluate, and develop academic or teaching staff. For example, with a school, college, or faculty of educology, there could be a set of units (divisions, departments, areas, etc.) of:

- analytic inquiry about education
- normative inquiry about education
- empirical inquiry about education.

Alternatively, these units might be named units of

- historical, jurisprudential, and analytic philosophical educology
- normative philosophical educology
- scientific, praxiological, and political praxiological educology.
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This set of units should remain constant in number. They would be permanent organizational divisions. Members of these units would teach the educology courses which the curriculum units (i.e., the committees, task forces, etc.) had created. It would be desirable, of course, to include members from all subdisciplinary units on any curriculum unit, and also to include them in any research unit. This arrangement would assure a balanced curriculum and a balanced research program.

There have been schools, colleges, and faculties of educology within existing institutions which have already applied to their organization some of the implications of the educology concept (but without being aware of the concept or the term 'educology'). For example, some institutions have had boards of study whose purposes included making curricular decisions, and these boards bore names such as "The Early Childhood Education Board," "The Secondary Education Board," and "The Primary Education Board." Other universities have had centers for research and higher degrees with the names, "Center for Communication and Media," "Center for Curriculum," "Center for Innovation," and "Center for Teaching Human Interaction." Some have had academic divisions and departments which suggest organization along the lines of subdisciplines of educology, for example, organizational units named "Division of Value and Policy Studies," "Division of Experimental Studies," and "Division of Curriculum Studies." A unit of value and policy studies suggests normative inquiry about education, but it does not necessarily imply that empirical and analytic inquiry about values and policies are excluded. Experimental studies suggest empirical inquiry about education, but does not distinguish among scientific, praxiological, and political praxiological educology. And curriculum studies suggest praxiological educology, but they do not exclude analytic and normative inquiry about education.

SUMMARY

What has been argued here is that the term 'educology' names knowledge about education. One category of knowledge that is possible to distinguish is quantitative knowledge. It can be classified with respect to the particular aspects or features of the field of educational phenomena which it describes and characterizes. Such categories are subfunds of educology. It can also be categorized with respect to the rules, logical operations, and procedures that are used to substantiate it. Such categories are kinds of quantitative knowledge about education, and the sets or rules that are used to substantiate the knowledge are the subdisciplines of educology.

These distinctions of (1) aspects or features in the field of educational phenomena, (2) subfunds of educology, (3) kinds of educology, and (4) subdisciplines of educology can be used in making decisions about course titles and descriptions, curricular arrangements, and organization of staff in schools, colleges, and faculties of educology. Use of these distinctions reduces the probability of category mistakes. Also, their use increases the likelihood of an arrangement of staff and curriculum
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which has coherency and flexibility, without ambiguity or evasiveness. Finally, use of these distinctions is likely to produce an organization which makes sense to those whom it arranges and which contributes to cooperative effort towards the worthwhile goal of extending knowledge about education.
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FOOTNOTES

1. The term 'studenting' is used here in the sense of intentionally trying to learn something under the guidance of someone else (but not necessarily succeeding in the attempt). It is being used in place of learning in order to make possible the distinction between successful and unsuccessful education. Elizabeth Steiner also uses this term (see her chapters in this volume), and this usage follows hers.

2. In an earlier work ("An Organizational Theory for Schools of Teacher Education and Faculties of Education," The Australian Journal of Education, Vol. 22, No. 1 (1978), pp. 52-71), we used 'educology' in the sense of 'studies about education'. The concept of educology and the argument that we set forth in this chapter is an extension of our previous work, and it hopefully corrects the mistakes made in that previous work.

3. The distinction of quantitative knowledge was made by Elizabeth Steiner. (See her chapters in this volume.) The categories of performative and qualitative knowledge are not treated in this discussion.

4. By 'standard of verification', we intend the set of principles that are used to substantiate a knowledge claim. At least three can be distinguished: the principle of observation; the principle of deduction (necessity reasoning); the principle of evaluation (evaluative reasoning). For an extensive explication of these standards, see J.E. Christensen and J.E. Fisher, Analytic Philosophy of Education as a Subdiscipline of Educology, Washington, D.C.: University Press of America, 1979, Chapter 1.

5. For an explication of the concept of praxiology, see James F. Perry's chapter in this volume, and also see Tadeus Kotarbiński, Praxiology: An Introduction to the Sciences of Efficient Action, translated from the Polish by Olgierd Wojtasiewicz, Oxford: Pergamon Press, 1965.

6. The sense of 'knowledge' intended in this definition is quantitative knowledge, i.e., true statements.


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10. This follows to some extent Elizabeth Steiner's use of the term 'meta-educology', although she includes more in this concept than philosophy of educology.


13. These subfunds of scientific educology are distinguishable with respect to the object of knowledge, i.e., the aspect or feature in the field of educational phenomena which can be characterized by knowledge. Also, these categories are possible if, and only if, education is being treated as the dependent variable in these subfunds. Otherwise, they are subfunds of other funds of knowledge (e.g., sociology, anthropology, psychology, etc.).


19. The School of Teacher Education of the Riverina College of Advanced Education, Wagga Wagga, N.S.W. (Australia), had this administrative structure in 1976.

20. The School of Education at La Trobe University, Melbourne, Victoria (Australia), had this structure in 1976.

21. The School of Education at Flinders University, near Adelaide, S.A., had this organization in 1976.